An Undergraduate Program to Address the Teacher Shortage: What We Thought We Knew

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ABSTRACT

After more than 20 years of a critical shortage in special education teachers, this mid-Atlantic state expedited program development for undergraduate-level teacher preparation programs. To meet the accelerated timeline, one program at a large public university used its graduate-level coursework as a model for the undergraduate level program. After initial implementation, it was clear that revisions were necessary. In this article, we provide a description of the program revision activities conducted, including (a) building a representative advisory board, (b) conducting a needs assessment, (c) developing a coherent curriculum map, (d) creating an action plan and implementing reforms, and (e) reviewing ongoing activities for continuous improvement. Implications are described, including how special education teacher preparation programs can use the CEEDAR Center Roadmap to Educator Preparation Reform to guide data-based program revisions, conduct a Q-Sort Activity as a systematic way to identify program priorities, and engage in program review activities, ultimately to better prepare special educators and reduce the teacher shortage.

KEYWORDS

Adult learning theory, CEEDAR Center, program revision, special education preparation

Traditional teacher preparation programs are pulled in a variety of directions as they attempt to navigate both political and professional waters in the development and maintenance of their programs. This tension is particularly acute in special education teacher preparation programs. For example, according to Hawkins (2022), between 1998 and 2018, 80% of states reported shortages in special education teachers. To address these shortages, many states have allowed alternative routes to licensure, such as providing provisional licenses to allow for full-time teaching while completing the requisite coursework (Peyton et al., 2021; Whitford et al., 2018). At the same time, standards of accreditation have been revised (Council for Accreditation of Education Preparation, n.d.) and there are an increasing number of calls for attention to coherence in programs (e.g., Cavanna et al., 2021; Floden et al., 2021). This coherence is "a process in which all courses within a program are aligned in terms of content and build sequentially on one another based on a clear vision of good teaching" (Cavanna et al., 2021, p. 28). In this manuscript, we describe how one special education program attempted to address these pressure points of the teacher shortage and program coherence while developing a new undergraduate program in special education. We detail the fast-tracked political process for state approval of the programs. Then, we provide a detailed description of how we used the CEEDAR Center Roadmap for Educator Preparation Reform framework (CEEDAR Center, 2020) to engage stakeholders, complete a needs assessment, and conduct a program review for our newly developed program. We conclude by describing implications relevant to program development and refinement.

A Call for Undergraduate Programs

Following the 1990 meeting of governors and consideration of *A Nation at Risk* (U.S. National Commission on Excellence in Education, 1983), the General Assembly in a mid-Atlantic state passed legislation and created regulations that required all teachers to have a bachelor's degree in a subject other than education before they could obtain initial licensure by way of a master's degree or an alternative route (Coy, 2017). This legislation, and the requisite regulations, were further reinforced by No Child Left Behind (NCLB, 2002) and the requirement for being highly qualified. To that end, virtually all Schools of Education in the state were graduate schools, providing initial licensure coursework through Master of Education, Master of Teaching, or Master of Arts in Teaching degrees in both traditional preservice preparation programs and in alternative pathways. Even with a combination of traditional and alternative routes to licensure, the state has faced an increasing teacher shortage, particularly in the areas of special education, elementary education, and mathematics. For example, in an annual report on the Condition of Education, the state's Board of Education noted 1,063 teacher vacancies in the 2019-2020 academic year, up from 440 in the 2010-2011 year (Scudder, 2022). More specifically, in analysis provided by the state's Department of Education, special education has been listed as either the top or near the top critical shortage area from 2003-2004 (the start of reporting) to the present. The shortage of special education teachers in this state has persisted since the pandemic, with the state Staffing and Vacancy Report (Virginia Department of Education, 2022) showing over 650 and 735 special education position vacancies on October 1 of the 2021-22 and 2022-23 academic years, respectively. This chronic need for teachers, particularly in special education, caused state leaders to reconsider having graduate level-only initial licensure programs.

The Sprint

In 2016, the Task Force for Diversifying the State's Educator Pipeline, and in 2017, the Advisory Committee on Teacher Shortages recommended that the state change regulations to allow initial teacher licensure at the undergraduate level. The then-Governor directed the Board of Education to "initiate emergency regulations creating an option for [the state's] public colleges and universities to offer an undergraduate program with a major in education" (Coy, 2017). The General Assembly passed legislation to amend the then-current code to allow for these undergraduate degrees in education. In fall of 2018, the next governor called for an accelerated pace to launch these programs. This accelerated pace allowed for any proposed university undergraduate initial licensure program submitted by April 1, 2019 to the State Council for Higher Education (SCHEV) to expect approval (if guidelines were met) by May 2019. The typical timeline for this approval process is three years.

Four Undergraduate Programs

One graduate level special education program in the College of Education and Human Development of a large state public university undertook the rapid development of undergraduate program proposals to meet the Governor's call. The result was four proposed programs (i.e., one degree proposal with four concentrations) for undergraduates in special education that were approved by SCHEV on May 14, 2019, the Board of Education on June 20, 2019, and launched in the fall 2019 semester. These included three initial licensure programs (K-12 students with disabilities who access the general curriculum, K-12 students with disabilities who access the adapted curriculum, PK-12 students who are blind/visually impaired) and one non-licensure program. Table 1 lists coursework in the students with disabilities who access the general curriculum program. Within the coursework, students have (a) three courses with field experience components within them tied to course assignments; (b) a sequence of three field experience courses designed to increase in time (i.e., 20-40 hours) and responsibilities (i.e., observational to supporting the Mentor Teacher to beginning independent teaching) across the program; and (c) a semester-long internship with back-to-back elementary and secondary internship placements. Because of the short timeframe for development, many of these courses and field experiences were the undergraduate equivalent of graduate level courses and field experiences that were already in place, including similar learning objectives and similar assignments. Yet, evidence indicates that undergraduate students require different approaches to learning (e.g., Yun & Park, 2020), and this became increasingly apparent as faculty began teaching the proposed courses. Additionally, the accelerated pace of program development resulted in delegated tasks and small working groups, resulting in faculty writing syllabi in an isolated fashion. The outcome was a program that had not been thoroughly mapped for how content is introduced and reinforced across courses to meet the needs of undergraduate learners. As faculty began to teach courses, they noticed a lack of understanding of how each course

contributed to the larger outcomes of the overall program, highlighting the lack of program coherence. Our program review and revision began in Spring 2020 and has continued to the present. In the summers of 2020-22, the authors received internal funding to complete additional program review specific to the students who access the general curriculum licensure program (hereafter: general curriculum program). The goal was to develop a coherent and scaffolded program that would produce undergraduate teacher candidates who would be successful novice special education teachers for students with disabilities who access the general curriculum.

TABLE 1: Courses in Undergraduate Program for Special Education for K-12 Students with Disabilities who Access the General Curriculum

Course Number	Course Title	Credit Hours
	Core Requirements – All Special Education undergraduate programs	
ED 302	Human Growth and Development	3
ED 201	Introduction to Special Education	3
ED 251	Classroom Management and Positive Behavior Supports	3
ED 351	Technology Integration for Specialized Instruction	3
ED 352	Assessment	3
ED 353	Individualized Behavior Supports	3
ED 354	Consultation and Collaboration	3
ED 381	Exploratory Field Experience	3
ED 451	Transition and Self-determination	3
ED 452	Intersectionality and Disability	3
ED 482	Internship	12
	Concentration Requirements – General Curriculum licensure program only	
ED 241	Characteristics of Students with Disabilities who Access the General Curriculum	3
ED 341	Language Acquisition and Reading Development	3
ED 441	Instructional Strategies for Reading and Writing	3
ED 443	Instructional Strategies for Math	3
ED 445	Clinical Practice and Seminar 1	2
ED 446	Clinical Practice and Seminar 2	2

Division Description

The Division of Special Education in the School of Education at this institution includes 11 tenured or tenure-track faculty, 15 term or clinical faculty, and approximately 42 adjunct faculty per semester. The Division includes three graduate-level initial licensure programs, seven certificate programs, three undergraduate initial licensure programs, and one undergraduate non-licensure program. On average, the Division has approximately 750 graduate students enrolled and delivers approximately 100 graduate-level courses per semester. In fall 2019, we began with two undergraduates officially enrolled in the BSED program. As of fall 2022, 57 undergraduates were officially enrolled in the BSED program.

Conceptual Framework

Our work was guided by two conceptual frameworks: program coherence and adult learning theory. First, program coherence, including both structural and conceptual, guided our thinking related to vision, coursework, and fieldwork. According to Tatto (1996), coherence is how the central ideas of teaching and learning are shared by all those involved in teacher education and how all the learning activities and opportunities are integrated to reach program goals. The goal of coherence in a program is not consistency in message; rather, it is the way in which coursework and fieldwork connect to central concepts and ideas that are foundational to the goals of a program. Critical to coherence is a clear program vision and a buy-in of all those involved in program implementation, including faculty, school personnel, and supervisors. This vision and the specific ideas behind it are meant to guide all choices of coursework, fieldwork, learning activities, and knowledge and skill focus with a scaffolded approach to teacher development across the course of the program and into induction. This deliberate connection between theory and practice, as well as university and schools, reflects the idea of both structural and conceptual coherence (Grossman et al., 1999; Hammerness, 2006). Programs that are more coherent tend

TABLE 2: CEEDAR Center Roadmap for Educator Preparation Reform Framework

Step	Description	Our Institution Actions
1. Engage key leaders	• Establish a steering committee • Generate support and buy in • Communicate a vision for reform	• Two faculty identified to lead efforts • Funding and graduate research assistant support secured
2. Facilitate a needs assessment	• Examine multiple sources of data • Engage external stakeholders • Gather faculty input • Leverage current initiatives	• Near replication of Sayeski & Higgins (2014) Q Sort • Included program faculty and external stakeholders
3. Determine program review focus	• Decide instructional focus of review • Select individual programs or courses for review • Create a workgroup to conduct the review	• Identified undergraduate general curriculum focus • Recruited workgroups for program review • Established all day retreat agenda to review
4. Review programs	• Choose program review tools • Establish program review process • Analyze program review data	• Used results of Q Sort for priority and essential items review • Conducted retreats for review process
5. Develop action plan	• Identify action steps for program improvement • Secure resources to support program improvement • Specify outputs and outcomes • Develop progress monitoring and data collection plan	• Conducted review process of core courses with other program faculty • Specified outcomes for implementation • Began action plan process
6. Implement reforms	• Address implementation opportunities and challenges • Develop faculty capacity	• Established undergraduate faculty discussion group • Established general curriculum teaching discussion group
7. Practice continuous improvement	• Collect and analyze data • Make program adjustments as needed	• Ongoing activities
8. Scale impact	• Communicate achievements • Scale efforts	• Ongoing activities

to produce teacher candidates who feel more efficacious and committed to the profession (Cavanna et al., 2021).

Adult learning theory guided our work in developing learning experiences. Acknowledging that adults learn differently from children is key to developing appropriate learning experiences. Specifically, we followed the theory described by Taylor and Hamdy (2013), an iterative model of learning from medical education. Within this model, adult learning begins when an adult is asked to complete a task that causes dissonance in their current level of knowledge, experience, or beliefs. This dissonance requires the candidate to reflect and observe the task from a different perspective. The candidate uses this different perspective to develop new concepts, experiment with new ways to accomplish the task, fail or succeed, and then consolidate the new learning into their existing knowledge. Critical to all aspects of this learning is the feedback provided by peers and experts (Taylor & Hamdy, 2013). This cycle is iterative in that changes in context, new learning, further

experience, and belief in the process impact the development of cognitive strategies to face the dissonance and embrace nuances and refinement in learning. Scaffolded support and feedback within this model are critical for persistence and retention. In other words, tasks must challenge candidates but cannot be too difficult, and feedback must be supportive and productive (Taylor & Hamdy, 2013).

USING THE CEEDAR CENTER ROADMAP

Given these two conceptual frameworks, the authors identified the CEEDAR Center *Roadmap for Educator Preparation Reform* (CEEDAR Center, 2020) as a guide for systematic activities of program review. The Roadmap is a planning framework for educator preparation programs to use when reforming a program. The CEEDAR Center created the Roadmap based on guidance from a review of 72 institutions of higher education who received 325T grants funded across a five-year period by the U.S. Department of Education Office of Special Education Programs (OSEP) to restructure and improve special education teacher preparation programs (CEEDAR Center, 2020; Sobel et al., 2014). While the Roadmap was intended to help programs integrate high-leverage and evidence-based practices into coursework and fieldwork through ongoing and collaborative analysis, the guidelines can be used in a variety of ways to engage in program reform. For example, although the Roadmap includes many examples of how state-level education agencies have used the framework, it also explains that other stakeholders, including deans, program chairs, or program leaders, may use this roadmap to guide reform processes, including at the program level (CEEDAR Center, 2020). Thus, not only is the Roadmap grounded in recommendations from the extensive OSEP-funded work around reform in special education teacher preparation, but it provides a systematic framework for reform that can be applied in different ways. See Table 2 for a list and description of the review steps suggested by the Roadmap. Faculty representatives completed each step of the Roadmap, starting in Spring 2020, though work on implementing reforms (step 6) and continuous improvement (step 7) is ongoing. Below we describe our actions in each step of the Roadmap towards building a coherent program to meet the needs of undergraduate teacher candidates.

Step 1: Engage Key Leaders

Given the rapid development of the undergraduate program and the overlap of faculty teaching in both undergraduate and graduate courses, program leaders anticipated the need for program review early into implementation. Because of this, the third author provided support and assistance to the first two authors to begin a program review with other interested faculty after the first semester of implementation. This occurred following an advisory board meeting for the graduate program in which local school administrators expressed excitement about the new undergraduate program.

Step 2: Needs Assessment

To begin the program review, the authors identified Q Methodology, as used by Sayeski and Higgins (2014), as a viable option for conducting a needs assessment. Q Methodology was originally developed by William Stephenson in the 1930s (Brown, 1993) as an attempt to combine qualitative and quantitative methods to "bring a scientific framework to bear on the elusiveness of subjectivity" (Coogan & Herrington, 2011, p. 24). The idea is to allow an individual to communicate his or her perspective about a topic in order for it to be examined and compared to others. In Q Methodology, representative statements are taken from a body of ideas around a topic, which can be from literature, interviews, videos, experts, and the like (Brown, 1993). Participants then organize these statements based on specific factors such as agree/disagree, important/unimportant. This activity is called a Q Sort (Coogan & Herrington, 2011) and is when "respondents compare each [statement] to each of the others and arrive at a true comparative judgment on where to place each item" (Thomas & Watson, 2002, p. 142). The outcomes of the Q Sort can then be analyzed, with an overall aim to "consider data in terms of the individual's whole pattern of responses" (Coogan & Herrington, 2011, p. 24).

Developing and Disseminating the Q Sort

Similar to Sayeski and Higgins (2014), we developed the Q Sort statements using CEC's (2012) Initial Specialty Set: Individualized General Curriculum, which contains 92 items that reflect knowledge and skills within the seven CEC standards that teacher candidates must be able to demonstrate for teaching students with disabilities who access the general curriculum. Given that Q Sort techniques should include 30-60 items (Thomas & Watson, 2002), we reviewed the CEC specialty set items to reduce and/or combine like items. For example, we eliminated items that were medically focused (e.g., types and transmission routes of infection disease) and items that overlapped with another standard, and we edited items to create consistent wording across items (e.g.,

FIGURE 1: Q Sort Directions and Sample Statements

Q Sort Directions
Sort the items into one of the following knowledge categories indicating the level of knowledge you believe graduates from our program should possess upon completion of our undergraduate special education program. 1. Below there are 55 items in a randomly ordered list on the left. Read through the list and become familiar with all of the items. Please note that students with disabilities (SWD) refers to students with high-incidence disabilities of LD, EBD, ADHD, ID, and autism, who are accessing the general curriculum. 2. Then, sort the items into one of 5 categories, indicating the level of knowledge for that item that you believe graduates from our program should possess upon completion of our undergraduate special education program. To sort the items, click on the item and drag it to the category box. Please note that there is no priority to the order of items within a category box, and you can move items from one category box to another as needed. You are limited to a specified number of items per category: **Mastery** (i.e., candidate applies the skill with ease and/or could teach others the concept; 7 items), **Application** (i.e., candidate could apply the skill in practice and/or has a strong grasp of the knowledge; 12 items), **Theoretical** (i.e., candidate could pass an exam question related to this concept; 17 items), **Superficial** (i.e., candidate would have passing knowledge of this concept and may know where to go for more information; 12 items), and **Limited** (i.e., content may be included in a course but not tested on an exam or a part of a course assignment/field experience expectation; 7 items). 3. After the sort, you will find an additional 5 blank items. If you think of a topic that is not covered on this list, but you believe is a "big idea" or important topic in special education, write your topic in one of the 5 blank items. 4. Once you have finished sorting the items, you will be asked to complete one demographic item.
Q Sort Statements
1. Candidate can identify barriers to accessibility of SWD in school environments and curricula
2. Candidate can articulate major laws and policies regarding referral and placement procedures for SWD
3. Candidate can state definitions and describe issues related to the identification of SWD
4. Candidate can identify and describe critical historical foundations, classic studies, major contributors, major legislation, and current issues related to SWD
5. Candidate can explain the continuum of placement and services available for SWD and least restrictive environment
6. Candidate can identify and provide consultation on effective prevention and intervention strategies within multi-tiered systems of supports
7. Candidate can establish a consistent classroom routine in a variety of educational settings
8. Candidate can use a variety of effective procedures for progress monitoring both appropriate and problematic social behaviors of SWD

observable and measurable action words, consistent terminology use). The first two authors discussed edits and came to agreement on a list of 72 statements.

The statements were then disseminated to three experts in the field for review; all three reviewers were at other institutions and had expertise in teacher preparation research, program development, and special education for students with disabilities who access the general curriculum. The experts were asked to (a) review a spreadsheet of the Q statements and identify whether each item should be kept, revised, or deleted; (b) respond to an open-ended question about any

items missing from the statements; (c) complete the Q Sort activity online in Qualtrics (which allowed participants to drag and sort the statements through an online survey); (d) rate the clarity of the Q Sort activity and the ease of completing it in Qualtrics, using a 5-point Likert scale; and (e) describe any suggested changes regarding the delivery format via Qualtrics. Feedback was returned from two of the three experts; feedback was solicited during April 2020 when the COVID-19 pandemic was beginning, and the third expert was unable to provide written feedback.

The first and second author then met to discuss feedback from the expert reviewers and make changes accordingly. Based on the expert reviewer input, we kept the online delivery using Qualtrics, revised items for clarity, and eliminated redundant items by deleting or combining items. Of the draft statements, we kept original wording for 26 items, deleted 29 items, revised 17 items, and added 12 new items. The final Q Sort activity, therefore, had 55 items that participants were asked to sort into five categories. Figure 1 includes ecxamples of the 55 Q Sort activity items.

The final 55 Q Sort items were disseminated through a Qualtrics survey, using the "Pick, Group, and Rank" question type. Following procedures used by Sayeski and Higgins (2014), respondents were asked to sort the items into five scaled categories: (a) Mastery Knowledge (i.e., candidate applies the skill with ease and/or could teach others the concept); (b) Application Knowledge (i.e., candidate could apply the skill in practice and/or has a strong grasp of the knowledge); (c) Theoretical Knowledge (i.e., candidate could pass an exam question related to this concept); (d) Superficial Knowledge (i.e., candidate would have passing knowledge of this concept and may know where to go for more information); and (e) Limited Knowledge (i.e., content may be included in a course but may not be tested on an exam or as part of a course assignment/field experience expectation). As with Sayeski and Higgins's (2014) study, we used a quasi-normal distribution for the number of items respondents could sort into each category, which forced respondents to prioritize items in the scaled categories at the extremes, allowing us to examine which items respondents prioritized for program outcomes. Respondents were limited in the number of items they could place in each category: 7 items in Mastery Knowledge, 12 items in Application Knowledge, 17 items in Theoretical Knowledge, 12 items in Superficial Knowledge, and 7 items in Limited Knowledge. See Figure 1 for the directions included in the Q Sort activity.

In addition to sorting the 55 items into five scaled categories, respondents were provided with five blank open-ended items in which they could add topics that were not included in the Q Sort activity but that they believed were important topics in special education. For each blank item, respondents could then indicate which knowledge level they would assign that item. The final item of the survey was an open-ended item for respondents to provide any additional feedback regarding knowledge and skills that they believe teacher candidates should possess upon completion of the program.

After receiving IRB exemption, we disseminated the Q Sort activity invitation via email to 15 internal stakeholders (i.e., faculty members actively teaching in the general curriculum program) and 18 external stakeholders (i.e., district administrators and school administrators); external stakeholders were invited to share the activity with special education teachers at their schools. All stakeholders were given four weeks to complete the Q Sort in Qualtrics, with three weekly email reminders sent. Of the 15 faculty members, 14 participated for a 93.3% response rate. One faculty member partially completed the Q Sort and asked that their responses not be included because of challenges with the electronic format. Of the 18 external stakeholders, six participated (five school administrators and one school district administrator), for a 33.3% response rate of invited external stakeholders. Since external stakeholders could forward the Q Sort to special educators, we do not know how many others received it, limiting our ability to identify the total response rate. Overall, there were 20 participants who completed the Q Sort activity, and all responses were anonymous.

Q Sort Results

The Q Sort was implemented to determine the knowledge and skill priorities of faculty and stakeholders for teacher candidates in our program, as Step 2 (Facilitate a needs assessment) of the CEEDAR Center Roadmap. To analyze the Q Sort data, we followed procedures used by Sayeski and Higgins (2014). Specifically, results of the Q Sort activity identified two categories of statements to be used to guide curricular priorities and programmatic coherence: Priority Items and Essential Items. We first determined the program Priority Items as those items rated by most (70% or more) respondents as Mastery or Applied (i.e., the top two categories in the sort). We then determined program Essential Items as the items rated by most (70% or more) respondents as Mastery, Applied, or Theoretical (i.e., the top

TABLE 3: Q Sort Essential and Priority Items

Priority Items: Candidate can...

- establish a consistent classroom routine in a variety of educational settings.
- make instructional changes to general curricula and lessons to make them accessible for SWD
- plan, conduct, and interpret formal and informal methods of progress monitoring
- use a variety of effective, non-aversive techniques to change targeted behavior and to maintain attention of SWD
- identify, plan, and implement effective practices for specialized instruction in comprehension and monitoring strategies
- effectively use error analysis to guide instructional decisions and provide feedback to learners
- effectively plan and implement all components of explicit instruction

Essential Items: Candidate can...

- describe defining characteristics of SWD who access the general curriculum
- identify ways to adapt the physical environment to provide optimal learning opportunities for SWD
- use a variety of effective procedures for progress monitoring both appropriate and problematic social behaviors of SWD
- define and correctly use specialized terminology from assessment of SWD
- make instructional and placement decisions based on data
- explain the continuum of placement and services available for SWD and least restrictive environment
- practice ethical responsibility to advocate for appropriate services for SWD
- describe and implement the collaborative and consultative roles of the special education teacher
- implement effective co-planning and co-teaching methods to strengthen content acquisition by SWD
- identify and provide consultation on effective prevention and intervention strategies within multi-tiered systems of supports
- devise, plan, and implement individualized reinforcement systems and environmental modifications to address all levels of behavior intensity
- identify, plan, and implement effective practices for:
    1. specialized instruction in phonics
    2. specialized instruction in phonemic awareness
    3. specialized instruction in fluency
    4. specialized instruction in math computation and fluency
    5. specialized instruction in math problem solving
    6. specialized instruction in mathematical reasoning
    7. specialized instruction in organizing and composing written products
    8. specialized instruction in written language
- effectively identify and teach learning strategies and study skills to enhance acquisition of academic content
- identify and implement research-supported methods for content- area instruction of SWD
- identify reliable sources of specialized materials, curricula, and resources for SWD
- identify and use appropriate technologies in instruction

three categories in the sort). Items that had already been identified as Priority Items were removed from the list of Essential Items. Finally, we reviewed the open-ended responses in the Q Sort and determined that all topics respondents provided were related to one or more of the 55 Q Sort activity statements, so none of the topics entered as open-ended items were included in the results.

Priority items. We identified seven statements as Priority Items (i.e., those items ranked by 70% or more of respondents as Mastery or Applied, the top two categories). As shown in Table 3, these seven statements were focused in the areas of specialized instruction, instructional change, behavior, and progress monitoring, and they included statements from the 2012 CEC Standards 2 (Learning Environments), 3 (Curricular Content Knowledge), 4 (Assessment), and 5 (Instructional Planning and Strategies). Specifically, for CEC Standard 2 (Learning Environments), priority items included *establishing a consistent classroom routine in a variety of educational settings* and *using a variety of effective, non-aversive techniques to change behavior and maintain student attention*. The priority item aligned with CEC Standard 3 (Curricular Content Knowledge) included *making instructional changes to general curricula to make content accessible for students with disabilities*. The priority items *planning, conducting, and interpreting formal and informal methods of progress monitoring* and *effectively using error analysis to guide instructional decisions and provide feedback to learners* aligned with CEC Standard 4 (Assessment). The last two priority items related to CEC Standard 5 (Instructional Planning and Strategies) were *identifying, planning, and implementing effective practices for specialized instruction in comprehension and monitoring strategies* and *effectively planning and implementing all components of explicit instruction.*

Essential items. We identified 23 statements as Essential Items (i.e., those items ranked by 70% or more of respondents as Mastery, Applied, or Theoretical, the top three categories, after removing the Priority Items). As shown in Table 3, these 23 items crossed all seven 2012 CEC standards, although the bulk of the statements were included in the 2012 CEC Standard 5 (Instructional Planning and Strategies). For example, eight essential items targeted specialized instruction in reading, math, and writing, two essential items emphasized effective strategies for content area instruction, and two essential items targeted technology use and specialized materials and curricula. The remaining 11 essential items covered a variety of skills across the other 2012 CEC standards, such as using co-planning and co-teaching, progress monitoring for social behaviors, practicing ethical responsibility in advocacy for students with disabilities, using reinforcement systems and environmental modifications to address a variety of behavioral intensities, and consulting with others on prevention and intervention strategies within multitiered systems of support (see Table 3 for the full list of Essential Items).

Overall, the Q Sort resulted in a list of the knowledge and skills that program stakeholders identified as critical outcomes for our undergraduate teacher candidates, categorized by Priority Items and Essential Items. The Q Sort, therefore, was well aligned to the CEEDAR Center Roadmap's Step 2 of conducting a needs assessment, as it provided a systematic, data-based way for us to identify program needs.

Step 3: Determine Program Review Focus

After the Q Sort was complete, we moved to Steps 3 of the Roadmap to determine the focus of the program review. We used the Q Sort results as the instructional focus of our review, since these were prioritized items aligned with the CEC standards. We then selected the program courses to include in the review. Specifically, the program review focus and activities included the undergraduate general curriculum program and associated general curriculum program-specific courses (see Table 1). The program review also included core courses that were required in all four undergraduate special education programs (i.e., the general curriculum program, two other licensure programs, and a non-licensure program). These core courses included Introduction to Special Education, Assessment, Collaboration and Consultation, Technology Integration, Classroom Management, Individual Behavior Supports, Transition, and Intersectionality.

Step 4: Review Programs

Once we had determined the program review focus, we planned a series of activities with targeted groups of faculty members to conduct the program review. First, we led a program review activity with a small group of faculty members who had expertise in the General Curriculum program. Next, we conducted the program review that was broadened to focus on the program core courses required in all four undergraduate special education programs; thus, faculty in this second group included program coordinators and faculty members from the other undergraduate licensure and non-licensure programs. Finally, we conducted program review activities with the full instructional faculty in our institution's Special Education division. In the sections below, we describe each of these working groups and their associated program review

TABLE 4: Sample of Curriculum Map for Selected Q Sort Statements

		Characteristics Course	
		Addressed (x or blank)	Knowledge Level (M, A, T, S, L)
CEC Initial Preparation Standards			
1. Learner development and individual learning differences			
Q54.	Candidate can describe defining characteristics of SWD who access the general curriculum	X	T, A
2. Learning environments			
Q7.	Candidate can establish a consistent classroom routine in a variety of educational settings		
Q11.	Candidate can identify ways to adapt the physical environment to provide optimal learning opportunities for SWD	X	T
3. Curricular content knowledge			
Q26.	Candidate can make instructional changes to general curricula and lessons to make them accessible for SWD	X	L
4. Assessment			
Q8.	Candidate can use a variety of effective procedures for progress monitoring both appropriate and problematic social behaviors of SWD	X	S
Q32.	Candidate can define and correctly use specialized terminology from assessment of SWD (e.g., types of scoring, types of tests)		
Q34.	Candidate can plan, conduct, and interpret formal and informal methods of progress monitoring	X	L
Q35.	Candidate can make instructional and placement decisions based on data	X	L

Note. M=mastery; A=application; T=theoretical; S=superficial; L=limited; SWD=students with disabilities

activities in detail.

General Curriculum Program Workgroup Retreat

To conduct program review activities specific to the general curriculum program and associated courses, the program coordinator identified two faculty who had experience teaching undergraduate students to participate with the first two authors and the program coordinator in a workgroup to review courses in the general curriculum program. After securing their agreement to participate in the project, we provided them with a list and description of the priority and essential items identified through the Q-Sort activity. In addition, we provided them with all the general curriculum course syllabi that had been included in the original program approval package. We asked that they read through these documents and be ready to discuss them in our retreat. In the all-day virtual retreat, all five members of the workgroup went through each syllabus to identify which essential items were ad-

dressed and/or should be addressed in each course of the program, including core courses. For each item, the group also identified the level of knowledge at which the essential or priority item would be addressed. This included superficial, limited, theoretical, application, and mastery. The group discussed each item across all courses. When there was disagreement, we discussed as a group until we reached consensus. In this way, the workgroup created a recommended curriculum map for both general curriculum courses and for core courses based on the Q-Sort statements. The workgroup also drafted a mission statement for the program, to be presented to the full faculty in the upcoming academic year, as well as a series of suggestions for additional action. These action steps included: (a) revising all syllabi as described by the group and having them approved by the curriculum committee, (b) developing a revised assessment plan, (c) creating course materials (e.g., case studies) related to the revised outcomes to support faculty, and (d) establishing a continuing undergraduate professional learning community for faculty.

Cross Program Workgroup Retreat

Following the program workgroup retreat, we scheduled a cross program workgroup retreat that included the first two authors and program coordinators for all three undergraduate licensure programs. We introduced the results of our Q-sort activity, identified the essential and priority items, and described the program workgroup decisions on these items for the core courses. The group discussed the preliminary curriculum map for each of these courses until consensus was achieved. This resulted in a complete curriculum map for essential and priority items and the associated level of learning expectation across all courses in the general curriculum program, including core courses. Table 4 includes a sample of the curriculum map developed for a general curriculum program-specific characteristics course. Similar to the general curriculum program workgroup, the cross-program workgroup identified future actions including (a) conducting cross-program assessment mapping in core courses; (b) developing materials to support core courses (e.g., case studies, lesson plan template) and internship courses (e.g., observation protocols); (c) using available resources (e.g., doctoral student involvement, faculty group meetings); and (d) creating an organizational system for material dissemination.

Faculty Report

Following the workgroup retreats, we presented the Q-study process, resulting essential and priority items, and curriculum matrix to the broader faculty during an instructional faculty meeting. After review, the faculty affirmed the items and matrix. In this same meeting, the authors facilitated a group process to review and discuss program mission and vision statements. Following this meeting, with the direction of the essential and priority items as well as the mission statement, the authors proceeded with syllabi revisions to match the curriculum map.

Step 5: Action Plan Steps

Given the outcomes of the Q Sort and faculty workgroups, specific action plan steps were developed during Step 5 of the Roadmap. These included: (a) developing faculty supports, (b) conducting an additional review for culturally responsive practices, (c) revising the monitoring and data collection plan, and (d) making course revisions. In addition, division administration agreed to add an academic program coordinator for the core undergraduate program, providing a point person for conducting program review, evaluating program outcomes, and establishing program policies and procedures.

Step 6: Implement reforms

After creating the initial action plan steps, we initiated Step 6 of the Roadmap through implementing reforms. Two consistent recommendations of the workgroups were implemented immediately to support and communicate curriculum coherence to instructional faculty, particularly adjunct faculty: (a) to develop materials for instructors of the revised courses, and (b) to establish faculty groups.

Development of Materials

Figure 2 includes the outline of a course "cheat sheet" developed for distribution to instructional faculty. In this sheet, essential and priority items as well as learner outcomes and CEC standards (2012) are identified and highlighted. Readings and suggested activities are also included. Assessment materials and descriptions are provided as well as other teaching suggestions. These sheets are housed on a shared drive with other course materials that are provided by previous instructors. These materials include PowerPoint presentations, in-class activity descriptions, and student case studies.

Faculty Groups

The authors established two voluntary faculty groups for those interested in teaching undergraduate students. The first group includes faculty from across programs who are interested in or who have taught undergraduate

FIGURE 2: Course Cheat Sheet Template (Characteristics Course)

Course Number	
Course Title	Characteristics of students who access the general curriculum
Course Lead	
Core or Program	

Prerequisites
None

Course Priority Items*

Course Essential Items*

Learner Outcomes and CEC Standards

Readings
Required Textbook(s)
Suggested Readings

Assessments/Major Assignments

Suggested Ideas/Activities

Related Resources

courses and it meets two to three times per semester. The group has met once to brainstorm how to increase undergraduate engagement in professional organizations and how to address critical dispositions for teaching in courses. The second faculty group meets monthly and includes current instructors in the general curriculum program. The first meeting focused on sharing strategies for student engagement, strategies for using technology, and highlights of successful activities. Additional meetings across semesters allowed faculty to share challenges of teaching undergraduate vs. graduate students, including necessity for repetition of instructions for assignments, dispositional issues, and making the student-to-teacher mindset shift. The result of these discussions has been the development of an undergraduate candidate handbook that includes the policies, procedures, and expectations of our specific program.

Step 7: Practice Continuous Improvement and Step 8: Scale Impact

After the initial action steps and reforms had been implemented, we engaged in the last two steps of the CEEDAR Center Roadmap to practice continuous improvement and scale the impact. These two steps are ongoing and will likely continue to be ongoing as we collect data on the outcomes of program reform and as we identify new needs within the program. For example, to practice continuous improvement, we have implemented a data collection process to help inform program adjustments. Data collection includes performance-based assessment data collected on key assignments in identified courses; student and instructor surveys to gather perceptions of the program's coherence, strengths, and needs; and informal feedback collected at regular faculty group meetings. Additionally, information gathered from the faculty groups established in Step 6 has identified areas in which we need to better support our teacher candidates and has highlighted additional sources of data required to monitor progress. For example, we are in the process of creating systematic ways to monitor students' grades and overall GPA, students' passing rates and number of attempts on state licensure exams, and data on students' professional dispositions. At the same time, we are also devising program policies and support

procedures for students who need additional help throughout the program. Licensure program coordinators meet regularly to review data and identify areas of strength and need around program coherence and student outcomes. The result of this process is an ongoing cycle of program review to ensure reform efforts are initiated, sustained, or adjusted accordingly.

As an example of continuous improvement, feedback and data from both instructors and students identified a new area of need around the clinical practice components of the program. Specifically, we identified that teacher candidates had gaps in knowledge learned in coursework and applying skills in fieldwork. Additionally, we found areas of need around scaffolded learning within courses, such as where lesson planning is introduced, reinforced, and applied within fieldwork. We have been exploring ways to address these gaps by identifying ways to increase practice-based learning opportunities across all courses (e.g., case studies, tutoring, lesson study) and mapping these opportunities across the program for a systematic, structured approach. While this part of our reform efforts is ongoing, it highlights how Step 7 of the Roadmap can be used to continue program adjustments and stay responsive to data-identified areas of need.

Although in its initial stages, we have begun efforts towards Step 8 to scale impact. One way we have done this is through disseminating our process and findings to both program stakeholders (e.g., advisory boards, faculty members) and more broadly to other programs and institutions through professional conferences. We have also obtained internal funding within the college to collaborate with other programs who have new undergraduate teacher licensure programs (e.g., elementary education). The intent of this collaborative project is to gather data on shared undergraduate teacher candidate needs across licensure areas and to pool resources to meet those needs.

DISCUSSION AND IMPLICATIONS

Across a student's experience in P-12 schools, the quality of teachers matters more to student achievement than any other school-based factor (Chetty et al., 2012; Rivkin et al., 2005). Evidence indicates that teacher preparation has an impact on the quality and success of special education teachers (Boyd, et al., 2009; Clotfelter et al., 2010; Jackson & Brueggman, 2009; Ronfeldt et al., 2014). Currently, P-12 schools are struggling to recruit and retain special educators and federal and state governments are looking to a variety of solutions to meet this challenge. Clearly, the development of a traditional teacher preparation program at the undergraduate level will not meet the immediate need for teachers; rather, the goal is to meet the need in a longer-term manner. Evidence indicates that better preparation leads to better retention rates (Peyton et al., 2021), which in turn can lead to more consistent instruction, particularly for hard-to-staff schools (Billingsley & Bettini, 2019). Thus, recruiting and retaining effective special education teachers to ultimately improve outcomes for students requires quality teacher preparation – a responsibility that rests on the programs that provide the preparation.

Critical to quality teacher preparation is the work of faculty to develop, disseminate, and hold true to a consistent vision and mission from teaching in individual courses to whole program activities. The purpose of this example is to illustrate the use of a systematic, data-based approach to program improvement using the CEEDAR Center Roadmap (2020). The goal of these activities was to develop a coherent preparation program that clearly emphasizes specific knowledge and skills and leads to better outcomes for undergraduate teacher candidates (Cavanna et al., 2021). This is not a one-shot deal; it requires continuous reflection of faculty and stakeholders both broadly and individually (Floden et al., 2021). It also requires faculty to make the identified specific knowledge and skills explicit to teacher candidates throughout the program (Floden et al., 2021). Going through the reflection and collaborative dialogue in the CEEDAR Roadmap process put us, as faculty, in what Fecho (2005) calls a "wobble" moment: "the wobble signals or calls attention to a shift in balance. Attention must be paid. A response must be authored" (p. 279). Asking questions such as "what are the critical knowledge and skills for successful, effective candidates from our program," unsettles the status quo and creates a "wobble" moment, but given the current context of teacher shortages, changing regulations, and media assaults on teacher preparation programs, it was necessary.

Without continuous review and input from stakeholders, programs can become stale and out of touch with school realities. The use of Q Methodology to understand what is critical to stakeholders is a natural fit. The Q-Sort activity allowed stakeholders, both faculty and school-based personnel, to provide individual, subjective perspectives on what is critical for special educators to know and be able to do while at the same time allowing for the compilation of those ideas to better guide program improvement. Use of the Q Methodology within the context and direction of the CEEDAR Roadmap allowed us to depersonalize the program revision process so it did not appear a call to

change specific individual courses. We believe this encouraged faculty engagement at multiple points across the process.

There are several limitations to the example described here that are important to acknowledge. First, we conducted this Q Study and the activities of the CEEDAR Roadmap with a new program, not one with entrenched courses and extensive faculty ownership of courses. This may have given us more flexibility in creating change; however, it also meant that we continue to revise our revisions as we teach these courses. Second, we began this project before the COVID pandemic and then had to shift to conducting our work to a virtual world. This changed how we engaged with faculty, students, and stakeholders. It also changed how our students engaged with our program. With a shift back to on-campus, face-to-face learning and field experiences, we are reevaluating some of our decisions and identifying new challenges and needs. Third, the participation of our school partners was limited by the quick shift to a virtual world and their need to figure out their school's response to COVID. Our future plans include a second round of outreach to school partners through regular advisory board meetings. Fourth, because we began this study before the impact of virtual learning and the events of the summer of 2020, when we conduct further outreach, we anticipate we will include Q-Sort statements related to culturally responsive pedagogy and knowledge of instructional technology. Similarly, our Q-Sort was disseminated before adoption of the updated CEC 2020 standards, and thus our programs will need to evaluate findings as we align the program to the new standards. Finally, because this review began so early in our implementation of the program, we were not able to immediately include our candidates' voices. As of this publication, our first group of candidates is completing their internship experience. One way we have attempted to understand their development is by asking them to complete concept maps related to their thinking of themselves as special education teachers at the beginning, middle, and at the conclusion of their programs. The analysis of these maps is ongoing but has provided faculty with valuable insights into and feedback on what the candidates are appropriating in their thinking as they progress (Miller et al., 2009). There are several implications of this example for teacher preparation programs. Our purpose was to provide a description of a process, not a product. This is a process that other programs might follow in a program review. In addition, as we mentioned several times, the involvement of administrators in providing faculty with space, time, and support to conduct the program review and then to disseminate to program participants is critical. We do not want to ignore the fact that there were varying levels of engagement and acceptance from faculty and the support of administrators helped in managing the perception of the project, particularly as it impacted individuals. The emphasis is on this being an iterative process and, clearly, the next series of steps is to provide more information and materials to faculty, include student voices in our program review cycle, and evaluate student outcomes.

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