A Digital Teaching Platform to Further and Assess Use of Evidence-based Practices

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Abstract

Advances in online learning have benefited rural special education teacher preparation programs through increased recruitment, access, and collaboration. This paper describes how additional challenges, such as monitoring teacher candidate use of evidence-based practices, can be addressed through a digital teaching platform. Project REACH online is a freely available website developed under a grant from the U. S. Department of Education. The platform includes information on 67 evidence-based practices and six formative assessments aligned with professional standards. The assessments, designed to further and measure teacher candidate skills, mirror daily classroom tasks, such as planning before instruction and reflection after instruction on the impact on student learning. Assessments are aligned with Common Core Learning Standards and include tasks, such as applying Universal Design for Learning to instructional plans, field-testing reports, and annotating student work. Faculty benefit from the constant stream of formative assessment data at their fingertips. For teacher candidates, the platform provides a vehicle for learning and tracking progress toward goals through surveys, feedback requests, and digital badges. The platform increases interactions among teacher candidates, graduates, and faculty and extends collaboration to content experts and school partners. Preliminary research suggests that teacher candidates report variance in efficacy for teaching students with disabilities related to their program, general or special education. Data may be helpful in revising courses and program sequences to foster greater teacher efficacy and abilities to use evidence-based practices to ensure all students in inclusive settings learn.

Keywords: learner centered assessment, technology, online learning, teacher preparation, evidence-based practices

The Internet is here to stay, providing instant constant communication and unlimited resources for learning. Rural teacher preparation programs in special education have benefited from advances in online learning that remove the constraints of a common location and time creating greater opportunities for recruitment, access, and collaboration (Ludlow & Brannan, 2010). In addition to convenience, new online teaching platforms, whether used as distance learning or supplements to face-to-face programs, satisfy a new generation of digitally savvy teacher candidates by using tools readily available in many K-12 settings to develop instructional competencies. Although online learning is growing, there remain many questions as to teacher candidates' readiness to learn effectively online and how teacher preparation programs use online tools to develop more highly qualified teachers to serve students in high need areas, such as special education and rural settings (Williamson, Martin, & Hess, 2002; Keramidas, 2012).

To address these questions of how to better prepare highly qualified dually certified general and special education teachers who provide rigorous and accessible services for all students in grades 1-12 in culturally diverse settings, Fordham Graduate School of Education (GSE) faculty redesigned and implemented a new teacher preparation program. The design efforts were supported through a 325T Program Improvement Personnel federal grant, *Rigor, Equity, and Access through Collaboration in Higher Education (Project REACH).* Outcomes of the new program were to increase teacher candidates' confidence in serving students with disabilities and using EBPs and increase communication among faculty and teacher candidates within courses, across courses, and to partners in field placements, including how feedback is used to improve teacher candidate performance, tracking teacher candidate growth toward professional standards and impact on student learning. To attain the Project REACH goals of increased communication and improved use of data to inform instruction, faculty needed a tool to systemize the use of formative assessment.

The Challenge of Formative Assessment Data in Teacher Preparation

In teacher preparation programs, faculty members grapple with how to effectively track teacher candidate progress toward knowledge mastery and implementation of evidence-based practices (EBPs) to teach diverse students in inclusive settings across courses and programs. Often, assessment data are not available for faculty until after courses are completed, making instruction adjustments to meet individual teacher candidate needs difficult. Similarly, teacher candidates lack a tool to monitor their own efforts to learn and implement the specific strategies taught and practiced across courses over time. The primary audience of assessments in teacher preparation is typically the professor, resulting in limited shared accumulation of knowledge and experience within the community of teacher candidates and program stakeholders.

A Solution: Project REACH Online

The free *Project REACH Online* digital teaching platform,

Author's Note

The website described in this article was developed under a grant from the US Department of Education H325T110016. However, those contents do not necessarily represent the policy of this US Department of Education, and you should not assume endorsement by the Federal Government or Project Officer, Sarah Allen. Projectreachonline.org is part of the initiative Project Rigor, Access, and Collaboration in Higher Education (Project REACH). Correspondence concerning this article should be addressed to Rhonda Bondie (rbondie@fordham.edu).

Rural Special Education Quarterly ✦ Volume 34, No. 1—pages 23-29 ✦ © 2015 American Council on Rural Special Education
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www.projectreachonline.org, harnesses the affordances of technology to address the problem of furthering and measuring teacher candidate mastery of EBPs in teacher preparation. Through this tool, teacher candidates work together as they monitor and direct their own learning and use of EBPs. In addition, key features, such as instant communication, unlimited potential for collaboration, digital badging, and automated learning analytics, emphasize desired learning outcomes for 21st century learners of any age (U.S. Department of Education, 2010).

Project REACH Online Objectives and Expected Outcomes

Project REACH Online established objectives and expected outcomes for faculty and teacher candidates to make significant changes in the use of formative assessment in teacher preparation. Through Project REACH Online, faculty use formative assessments to monitor growth of teacher candidate competences by offering feedback efficiently. The course assessments, normally kept in unsearchable files, are now submitted to a searchable database. This database enables faculty to build a body of shared knowledge of beginning teacher pedagogical content knowledge and to provide induction support for graduates and monitor teaching with EBPs continuously. Faculty use reports on demonstrated teacher competencies to adjust course instruction and research impact of teacher preparation on teacher candidate impact on student learning.

Teacher candidates use the Project REACH online platform to self-assess, set goals, and monitor growth in their knowledge and use of EBPs to support all learners in culturally diverse inclusive settings. As teacher candidates participate in discussions and share instructional plans, they develop instructional competencies aligned to professional standards, seek and offer feedback, and reflect on teaching by field-testing lesson plans. Beyond course grades, teacher candidates share accomplishments through publishing in the field-testing database and earning digital badges. The website is available to further learning throughout induction and career.

Theoretical Framework: 21st Century Learner Centered Assessments

The digital teaching platform design is based on Huba and Freed's (2000) learner-centered approach to assessment as "an activity assigned by the professor that yields comprehensible information for analyzing, discussing, and judging a learner's performance on valued abilities and skills" (p.12). Figure 1 shows the learner-centered assessment process as a cycle of learning EBPs, planning instruction, reflecting on impact on student learning, and sharing information with ongoing tracking of progress.

These online assessments, also called performance tasks, mirror daily classroom responsibilities and are similar to typical assignments in teacher preparation courses, such as writing lesson plans; however, the process used to complete the assessment is very different through the digital teaching platform where collaboration and support are available 24-7 with a click of a fingertip, and teacher candidates can request feedback, co-author instructional materials, view publishing criteria and help resources, and examine exemplars.

Work Flow for Teacher candidates

Teacher candidate use of *Project REACH Online* is embedded in the special education foundation course, which is offered both online and face-to-face, and taken by all special and general education teacher candidates. This enables faculty to collect a baseline survey of all teacher candidates on program entry, while candidates are able to set goals and track progress from the beginning of their program related to using EBPs. Teacher candidates begin the process outlined in Table 1 by creating a free account with a personal homepage where they can monitor course assignments and use this resource throughout their career.

Step 1: Learn Evidence-based Practice

The *Learn Evidence-based Practice* section of the website provides materials to support beginning teachers in developing the knowledge and plans for implementation of EBPs used in a tiered support system related to Assessment, Behavior, Literacy, Instructional Strategies, and Inclusive Practices. Website resources are being developed for 67 EBPs, including a description, classroom examples, step-by-step guide for implementation, links to learn more, and an online discussion area. These resources include images and videos selected for beginning educators. Faculty may assign resources to teacher candidates enrolled in specific courses and require a knowledge quiz or use of the EBP in a performance task.

Step 2: Plan Instruction

Project REACH Online includes six performance tasks: (a) *Unpack curriculum standards* to create learning goals for students, (b) *develop multiple assessments* to measure student learning of the curriculum over time, (c) *design differentiated lesson plans*, and (d) *apply UDL*, considering student characteristics in relation to the established curriculum to remove barriers. Following instruction, a teacher candidate reflects on the impact of instruction on student learning through (e) a *field-test* report and (f) analysis of *student work*. Tasks are related to build a full instructional plan. For example, unpacked standards can be related to an assessment and, then, the assessments to a lesson plan. In this way, candidates receive feedback on each part before building an entire lesson. Each performance task is aligned to the *Danielson Framework for Teaching* (2013), *edTPA*, and the *Interstate Teacher Assessment and Support Consortium* (InTASC) standards (Council of Chief State School Officers [CCSSO], 2011) and requires use of *Common Core Learning Standards* (National Governors Association Center for Best Practices & CCSSO, 2010) or standards, such as *Next Generation Science* (NGSS Lead States, 2013).

Figure 2 displays how separate fields for each step with help prompts, quality criteria, and an easy means to request feedback for work in progress foster deliberate thinking; thus, the online performance task both advances learning while automatically collecting assessment data. Co-authors may be added to an instructional plan, emulating how teachers often plan collaboratively with co-teachers, paraprofessionals, service providers, and volunteers in schools. This is particularly useful for teacher candidates in rural settings because the process can take place synchronously or asynchronously modeling the use of technology to increase opportunities for effective, time-efficient collaboration.

Table 1.

Project REACH Learning Path for Teacher Candidates

	Ongoing: Track Progress
Survey Use of EBPs	Survey to determine the frequency of EBPs and confidence in teaching students with disabilities. Take the survey annually for 5 years as one measure of changes in practice.
Set Goals	Consider survey results and current students; select an evidence-based practice to learn.
Publish	Submit instructional materials for peer-review and potential publishing.
Earn Digital Badges	Submit evidence of use of EBPs to earn badges. The badges represent the use of specific EBPs and are aligned to the edTPA and Danielson rubrics that measure teacher competencies. Share badges through social media such as Facebook, Twitter, LinkedIn, and Pinterest. Print and/or post digital badge certificates as evidence of accomplishments to share with employers and college application reviewers.
	Step 1: Learn EBPs (EBPs)
Explore, Think, & Discuss	Use the resources developed by experts in the field specifically for classroom teachers to develop knowledge about specific EBPs and guides for classroom implementation. Participate in online discussions through comments and questions.
	Step 2: Plan Instruction Using Learning and Collaborate
Collaborate and Request Feedback	Start New or use the tool bar to Build on a design in the field-testing database (Save & Modify). Invite other Project REACH users to collaborate on instructional plans. Request feedback at any time from colleagues and faculty.
Unpacking Standards	Use content knowledge to restate standard in language used with students and identify evidence in student work that will show mastery of this standard.
Multiple Assessments	Plan multiple assessments measuring student mastery of a standard, considering the communication method and feedback to ensure students and teachers monitor learning.
UDL Solutions	Consider curriculum barriers created by the interaction between student characteristics and the established curriculum; then, use EBPs to remove these curriculum barriers.
Differentiated Lesson Plans	Plan a lesson with specific steps considering grouping, assessment, and EBPs.
	Step 3: Reflect on Impact
Field-Testing	Implement published material with students and complete a field-test to report on the lesson instructions, use of EBPs, and impact on student learning.
Annotating Student Work	Upload and annotate student work resulting from a published UDL solution or differentiated lesson plan. Identify how annotations progress toward mastery of the curriculum standard, student strengths, and needs, and add comments including next steps, and questions.
	Step 4: Share Accomplishments
Continue Professional Learning	The need to learn and use EBPs is continuous, and new research emerges and teaching settings changes. Continue to learn, share, and add badges throughout career. To maintain earned badges, complete the annual survey to monitor use of EBPs:
	Field-test, like, bookmark, and save & modify published materials.
	Use a file sharing library.
	Participate in My Learning forum.

Figure 1.

My Homepage monitors teacher candidate use of EBPs

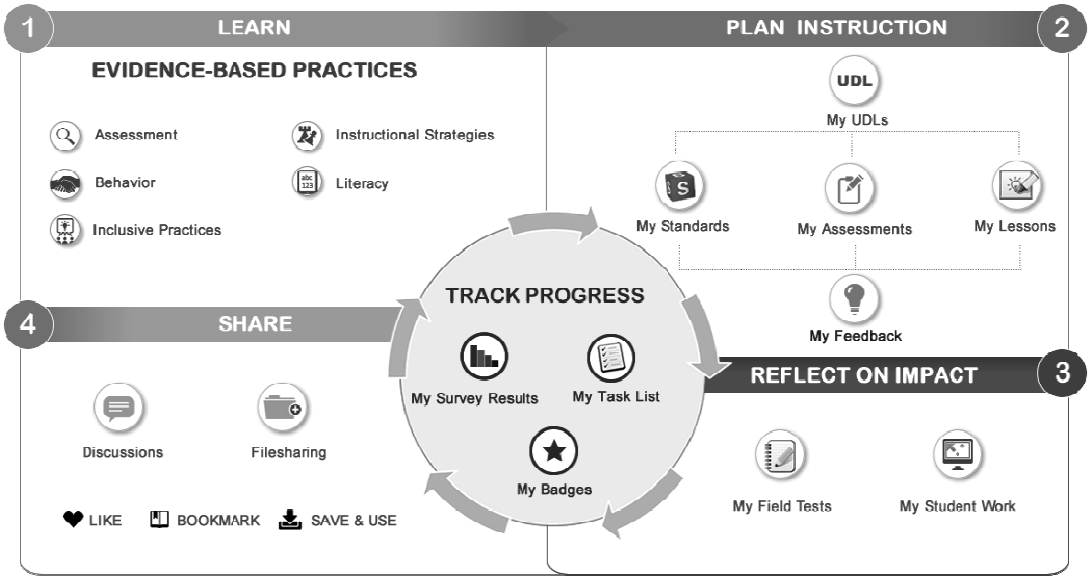
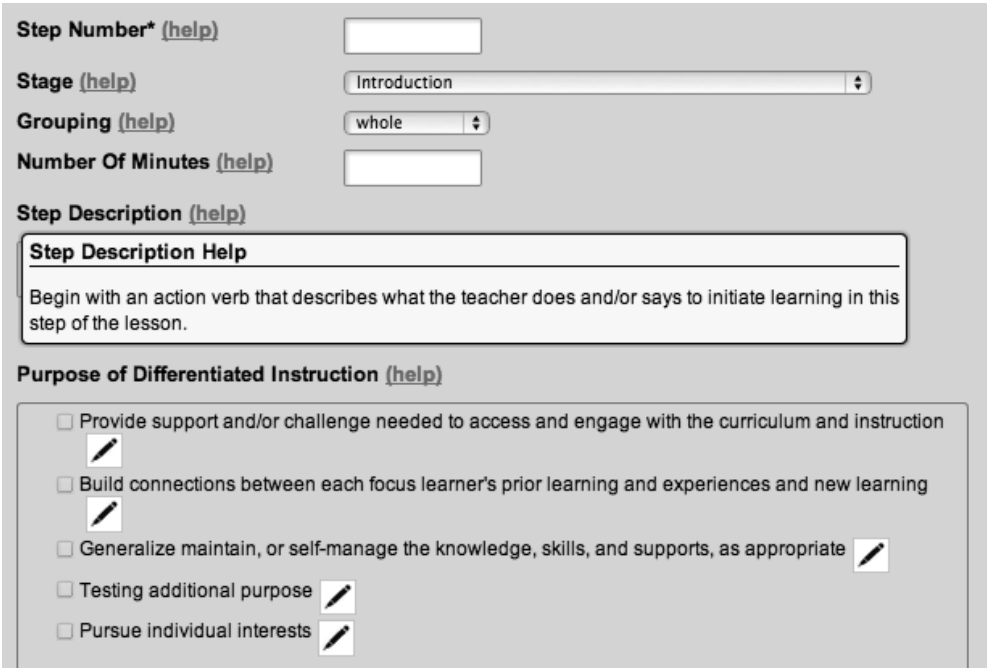


Figure 2.

Differentiated lesson plan, showing supports for each step of a lesson.



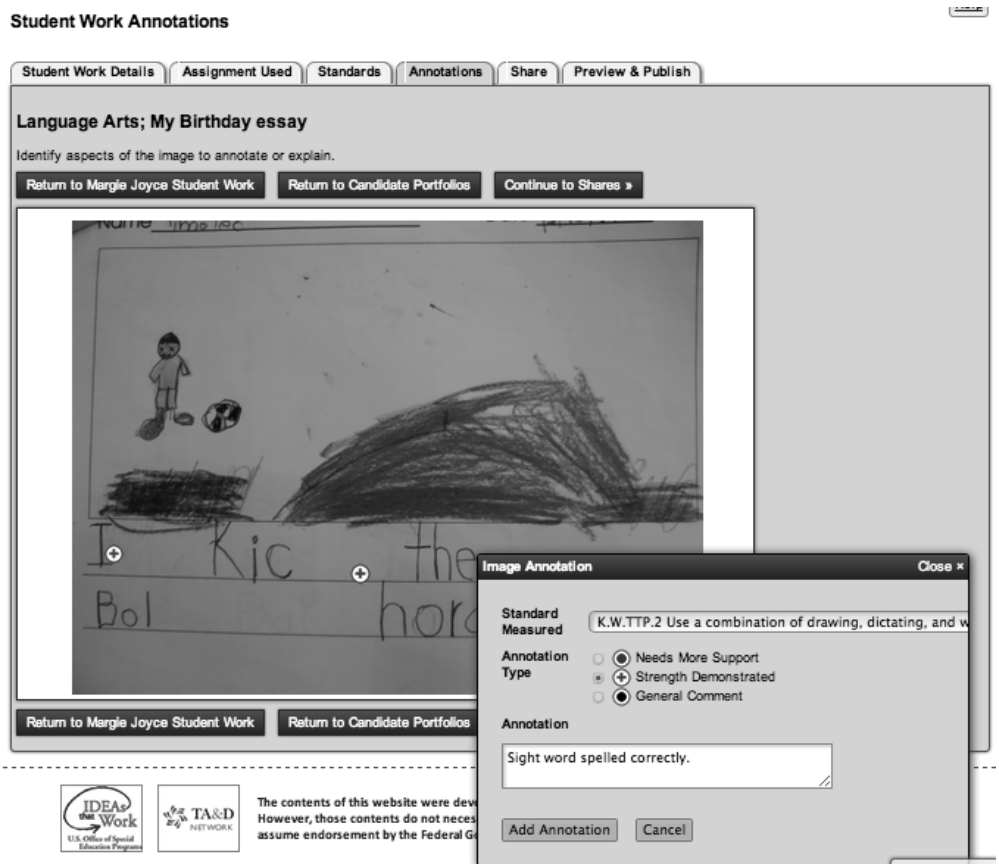
The *Request Feedback* tool is always available while teacher candidates plan instruction and reflect on student work. The feedback tool encourages teacher candidates to use the "Ladder of Feedback" by guiding users through four steps: (a) clarifications, (b) values, (c) concerns, and (d) suggestions (Perkins, 2003). This process helps to ensure clear actionable feedback and rehearses an EBP for offering feedback with teacher candidates in an untimed online format.

Step 3: Reflect on Impact

After implementing a lesson plan with students, teacher candidates are encouraged to submit a field-test report and

Figure 3.

Annotating student work by identifying strengths and needs related to standards.



annotate a piece of student work to determine evidence of learning achieved. Figure 3 shows how a simple cell phone picture of student work can be uploaded and annotated. A family permission slip for publishing the student work into the field-testing database is available on the website. Sample student work can be related to the standards and displayed in the field-testing database.

Field-test

Teacher candidates submit implemented lesson plans for peer review and potential publishing in the field-testing database. This database is distinctly different from other websites with instructional materials. On the Internet, it is often unclear how published lessons are actually implemented by teachers in different classrooms and what the impacts are on student learning (Milman & Bondie, 2012). The field-testing database has two distinct advantages; the resources are designed by and for beginning teachers and use pedagogical knowledge acquired in the preparation program. Held together by a shared instructional philosophy, the field-testing database invites teacher candidate participation into at least the early years of their careers. Through field-testing, teacher candidates contribute resources and examples of student work to literally build and improve the instructional plans' potential to serve diverse students in the future and faculty gather implementation data on specific EBPs by using field-testing as an assignment for a course. Table 1 displays the learning path for teacher candidates in Project REACH.

Tracking Progress: Measuring Use of EBPs

Teacher candidates are encouraged to set goals and track their own progress through the online survey and digital badges. The number of Likes, Field-tests, and comments on teacher candidate published instructional materials also may serve as evidence of accomplishments.

Survey as Diagnostic and Measure of Growth

In addition to building a strong knowledge base in content and pedagogy, teacher preparation programs should endeavor to increase self-efficacy in their candidates (Thompson, 2003). Teacher efficacy may be related to longer commitments to a teaching career. For example, Ware and Kitsantas (2007) found that "educational interventions focusing on teacher efficacy and collective efficacy may help retain teachers by enhancing their efficacy beliefs that they can deal with everyday challenges as a team" (p. 209). With this understanding, the annual Likert scale survey measures teacher candidate use of EBPs, confidence in teaching students with disabilities, and expectations for career. Teacher candidates

take the survey at the beginning and conclusion of their program and annually for 3 years after graduation.

Digital Badges

A digital badge is a visual representation of an accomplishment, such as a skill, knowledge, or application of professional knowledge. Badging is emerging as a way for youth to demonstrate learning outside of school and for working professionals to document their development and accomplishments. Faculty can create badges to represent the demonstration of skills mastered through coursework that might not be recognized in a student's grade. For example, in the collaboration course, the professor might create a badge for listening, identifying the specific criteria of a good listener and challenging teacher candidates to provide evidence of their mastery of listening skills. Badges are aligned with the Danielson Framework for Teaching (2013) and InTASC (Council of Chief State School Officers, 2011) criteria and can be printed or shared through social media.

Learning from a Digital Teaching Platform

One concern in online learning experiences in teacher preparation programs is that teacher candidates may lack the necessary self-regulation skills for successful asynchronous learning (Williams et al., 2002). To address this concern, the features available on the Project REACH digital teaching platform are aligned with the seven feedback practices that foster self-regulated learning practices identified by the Nikol and Macfarlane-Dick (2006) synthesis of the literature on formative assessment: (a) helps clarify what good performance is (goals, criteria, expected standards), (b) facilitates the development of self-assessment (reflection) in learning, (c) delivers high quality information to students about their learning, (d) encourages teacher and peer dialogue around learning, (e) encourages positive motivational beliefs and self-esteem, (f) provides opportunities to close the gap between current and desired performance, and (g) provides information to teachers that can be used to help shape teaching.

While Project REACH adds another digital platform that teacher candidates must learn, the benefits of feedback and self-regulation may outweigh the costs. This is just one challenge of many that faculty members will face. Initial explorations suggest the digital platform generates useful data and has potential for induction, collaboration, and ongoing program improvement.

Induction through e-Mentoring

Increased collaboration may continue through the digital teaching platform after graduation into induction through e-mentoring. Digitally savvy mentors with specific subject area and grade level expertise are likely to be found through the Internet to support new teachers, particularly where expert mentors are not locally available. When examining teacher attrition in public schools from 1993 to 2003, the "data show that high-poverty, high-minority, urban, and rural public schools have among the highest rates of turnover" (Ingersoll, Merrill, & Stuckey, 2014, p. 23); yet, intensive mentoring programs have shown increases in teacher retention (Darling-Hammond & Sykes, 2003). E-Mentoring has the potential of providing resources, ongoing support, and expertise to teachers in locations with few resources and greater student needs.

Collaboration with Colleagues, Content Experts, and School Partnership

The expertise of faculty can be expanded through collaboration with other departments, organizations, universities, and K-12 schools. For example, content experts, such as professors or doctoral students in specific disciplines may offer feedback to teacher candidates on lesson plans. Collaborating with content area experts is mutually beneficial, helping teachers extend their content knowledge while sharing pedagogical approaches with the experts. Since a common location and time is not required for meaningful communication, collaboration is facilitated, particularly in rural settings where traveling for face-to-face meetings would be prohibitive.

Ongoing Teacher Preparation Program Improvement

In the spring of 2013, pilot research began to examine the diagnostic-assessment self-reported survey responses of teacher candidate use of EBPs and confidence in teaching students with disabilities. The study compared the diagnostic survey results of 78 participants from four different teacher preparation programs, including childhood and adolescence, dual and single certification, and traditional and alternative certification. Quantitative analyses revealed that candidates in the alternative certification adolescence general education program reported significantly lower teacher efficacy, specifically efficacy related to special education, and lower expectations for length of teaching career, as compared with teacher candidates in alternative and traditional special education and dual certification programs (Bondie, Uzun, & Cho, 2014).

This finding could be further explored through program and course content revisions that are monitored through the digital teaching platform to examine the relationships among increased mastery experiences, modeling, feedback and verbal persuasion and reported teaching efficacy (Bandura, 1986). Having data like these available to faculty may lead to a more personalized and strategic teacher preparation program fostering greater teaching efficacy leading to improved classroom performance and, ultimately, greater expectations for a longer teaching career (Ware & Kitsantas, 2007).

"Walking the Walk" in Rural Special Education

Using technology as a vehicle for assessment and learning models in teacher preparation mirrors the expected use of technology with K-12 students. The digital teaching platform while mirroring daily tasks from the classroom, also encourages 21st century learning where collaboration, remixing, liking, field-testing, and offering and receiving feedback are central to learning. The online platform enables faculty to "walk the walk" of integrating technology and using data to inform instruction.

In addition, for rural special education programs, barriers, such as common times and places, expertise within a reasonable distance, and access to programs and courses, are eliminated through the use of the online platform (Ludlow & Brannan, 2010). Further, online tools may enable schools to offer clinically-based programs where teacher candidates are

working in a rural school while participating in classes online. Therefore, digital tools may be used to address personnel shortages and provide ongoing induction support aimed at teacher retention (Ludlow & Brannan). The opportunity to share resources and even faculty with other institutions becomes a low-cost reality. The practical benefits are clear, and many are well established in research examining rural special education teacher preparation and distance learning.

However, any online platform also may provide innovative improvements to teacher preparation that increase the number of highly qualified teachers prepared to serve and challenge all learners. For example, the increased shared formative assessment data that automatically collects and reports 24/7 dramatically changes the common knowledge of teacher candidate instructional competencies that faculty can use to tailor courses to specific teacher candidate needs. Having this type of assessment data readily available is particularly useful in rural settings where faculty may be dispersed and have limited meeting times to discuss teacher candidates. More research is needed to explore how these new online assessment methods may contribute to the development of teacher candidate instructional competencies, as well as shifts in competence beliefs and teaching career expectations (Vernon-Dotson, Floyd, Dukes, & Darling, 2014). The possibilities, such as Project REACH online, for formative assessment and data use may shift the future of research in online platforms in rural special education teacher preparation from exploring the removal of barriers to providing evidence of improved program effectiveness for preparing highly qualified teachers.

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