

ePortfolios: Promoting Special Educator Adaptive Expertise Through Reflection in a Web-Based Learning Community

Serra T. De Arment, Angela P. Wetzel, and Evelyn Reed
Virginia Commonwealth University

In an era of accountability, teachers must be prepared to adapt to the variability they encounter in today's classrooms. Instead of knowing only routine responses to the challenges of practice, teachers need a repertoire that is characterized by adaptive expertise. Preservice preparation can foster teacher candidates' adaptive expertise through the use of ePortfolios as web-based learning communities built upon reflection and feedback. This article reviews the literature on adaptive expertise and uses a learning-to-teach-in-community framework to explain the value of ePortfolios for supporting the development of adaptive expertise. Further, a design and evaluation plan is presented for an ePortfolio-based learning community in which special education teacher candidates practice the skills and dispositions necessary for adaptive expertise through reflection prompts that are based on real-world classroom cases and receive feedback from program faculty and practicing special educators.

Today's teachers face not only common challenges in learning to teach, but a profession filled with variability and changing instructional contexts. For special education teachers, variability is an expected part of practice due to the nature of providing individualized services for children with disabilities. However, special educators face additional challenges in their traditional pedagogical roles, as well as their new roles in collaborative teaching, that require instruction and assessment in multiple content areas, new professional partnerships (Billingsley, Griffin, Smith, Kamman, & Israel, 2009), and the demand to continually adapt instructional and assessment strategies to reflect emerging evidence-based practices (Brownell, Sindelar, Kiely, & Danielson, 2010). Considering the persistent problem of teacher attrition in special education (Billingsley, 2004; Boe & Cook, 2006) and the current educational climate, which emphasizes the importance of special education teacher quality (Council for Exceptional Children, 2012), it is imperative that aspiring special educators be prepared to adapt to the variability and challenges they inevitably will face in practice. Special educators need to be prepared with critical metacognitive and cognitive skills and dispositions that will help them persist in the field and achieve positive outcomes for their students.

To support these critical outcomes of special educator preparation, this paper offers a framework for using ePortfolios as a web-based learning community platform for engaging teacher candidates in ongoing reflection and feedback with experienced educators in order to promote candidate development of adaptive expertise. First, we review the literature on adaptive expertise, including key dispositions and metacognitive and cognitive skills, through a lens of relevance for teacher preparation. Next, we discuss the ePortfolio as a tool to support a web-based learning community for promoting teacher candidates' development of adaptive

expertise through reflection and feedback. Finally, we articulate the design and evaluation plan for an ePortfolio-based learning community in which special education teacher candidates practice the skills and dispositions for adaptive expertise through reflection prompts based on real-world classroom cases and receive feedback from program faculty and practicing special educators.

Adaptive Expertise: The Gold Standard

De Arment, Reed, and Wetzel (2013) propose adaptive expertise, the "gold standard for becoming a professional" (Hammerness, Darling-Hammond, & Bransford, 2005, p. 360), as a conceptual framework that, when established as an organizing structure in the design of teacher preparation programs, supports the development of teacher candidates in special education, as well as general education, who enter practice with the knowledge, skills, and dispositions required to work efficiently in the routine aspects of teaching and to transfer knowledge and adapt to the complexity of teaching roles and the changing dynamics of the classroom environment. Furthermore, the tenets of adaptive expertise echo the knowledge and skills domains for key 21st century competencies, as articulated by the National Research Council (Pellegrino & Hilton, 2012): cognitive (e.g., critical thinking, reasoning, innovation), intrapersonal (e.g., flexibility, initiative, appreciation for diversity, metacognition), and interpersonal (e.g., communication, collaboration, responsibility). The De Arment et al. (2013) framework parses out the previously reported two-dimensional construct (Crawford, Schlager, Toyama, Riel, & Vahey, 2005) and organizes the adaptive expertise literature around three dimensions: adaptive dispositions, metacognitive skills, and cognitive skills.

First, adaptive experts understand the world as a variable, changing context (Crawford et al., 2005). Thus, adaptive experts recognize that challenges in practice may reveal the limitations of individuals' knowledge and understanding (Crawford et al., 2005) and require them to ask questions (Schwartz, Bransford, & Sears, 2005), seek feedback, and take managed risks to respond to novel situations (Crawford & Brophy, 2006). Adaptive experts are comfortable modifying previous knowledge and assumptions based on new information (Bransford, Derry, Berliner, & Hammerness, 2005; Lin, Schwartz, & Hatano, 2005; Schwartz et al., 2005). In addition to adaptive dispositions, critical cognitive skills are required for adaptive experts. Adaptive experts are flexible and able to respond to variability in contexts of practice (National Research Council, 2000) by modifying existing or inventing new procedures (Goodnow, Peterson, & Lawrence, 2007; Hatano & Oura, 2003) to meet the current challenge using data and thoughtful consideration while also accounting for multiple perspectives (Crawford & Brophy, 2006; Crawford et al., 2005; Fisher & Peterson, 2001). Finally, metacognitive skills enable adaptive experts to self-assess both their own learning (Bell, Horton, Blashki, & Seidel, 2012; Bransford, 2004; Crawford & Brophy, 2006; Crawford et al., 2005) and the processes and outcomes of their performance in practice (Crawford et al., 2005; Lin, Schwartz, & Bransford, 2007). Further learning occurs through the analysis of the process and outcomes involved in problem solving and the selection of efficient or innovative approaches (Crawford et al., 2005; Lin et al., 2007); results inform opportunities to modify existing knowledge and procedures or to invent new procedures (Goodnow et al., 2007; Hatano & Oura, 2003).

Adaptive expertise is described as a balancing act between routine efficiency and innovation (Bransford et al., 2005). Routine experts are highly adept in the efficient performance of a particular skill set within environments with little variability (Bransford, 2004; Bransford et al., 2005; Hatano & Inagaki, 1986; Inagaki & Miyake, 2007); the specificity of their domains, however, can limit their ability to be flexible in response to a changing context of practice (Crawford & Brophy, 2006). Adaptive experts, by contrast, not only work efficiently but are able to select and justify the use of routine versus innovative approaches (Bransford et al., 2005; Schwartz et al., 2005).

Though some suggest that routine expertise must precede the development of adaptive expertise, evidence from research in medicine, business, and engineering suggests the potential for development of the two synchronously along the trajectory from novice to expert (Barnett & Koslowski, 2002; Crawford, 2007; Crawford & Brophy, 2006; Fisher & Peterson, 2001;

Martin, Petrosino, Rivale, & Diller, 2006; Varpio, Schryer, & Lingard, 2009). However, at present, evidence to support pedagogical models and strategies and assessment methods for promoting adaptive expertise in teacher educator candidates is limited (Janssen, de Hullu, & Tigelaar, 2008; Soslau, 2012). Janssen et al. (2008) analyzed teacher candidate reflections, and findings indicate reflection on positive teaching experiences promotes adaptive dispositions, such as motivation, and the cognitive and metacognitive skills required to develop innovative procedures. Bransford (2007) proposed that activities that engage learners in reflection also promote metacognitive and cognitive skills for adaptive expertise. Further, Soslau (2012) observed supervisor-student conferences following field experiences and interviewed participating students and supervisors. Results suggest that teacher educators can promote adaptive expertise by guiding students through a reflection of both the routine, as well as the unanticipated, variable, and context-specific elements of the student teaching experience. Lin et al. (2007) suggested that when learners are prompted with various "what if" scenarios as they problem solve, they can develop "smart tools" that generalize across situations and can be applied in future contexts. These investigations highlight two components of program design—reflection prompts and feedback to teacher candidates—that offer potential mediums for positively impacting the development of teacher candidates' skills and dispositions for adaptive expertise.

ePortfolios: A Web-Based Context for Learning in Community

Teacher development is neither a solitary nor a linear process; it requires, instead, the acquisition of content and pedagogical knowledge, application and challenge within varied teaching contexts, reflection and revision of assumptions, and deeper understanding of the complexity of teaching. This cyclical process is optimized by learning in community with faculty, peers, and accomplished practitioners who share their experiences and reflections to support an inquiry stance to teaching. In a community of learners or inquiry, members seek and present resources, apply theoretical frameworks to shared experiences, investigate the effectiveness of strategies, examine beliefs, and build problem solving schemas for shared dilemmas (Hammerness et al., 2005).

This model of teacher development is congruent with recent recommendations for reforming teacher preparation by the National Research Council Committee on Defining Deeper Learning and 21st Century Skills (Pellegrino & Hilton, 2012), which was charged with identifying the knowledge and skills that students need to

acquire for working in a rapidly changing world. The committee's report highlighted cognitive, intrapersonal, and interpersonal competencies that are related to positive adult outcomes. To ensure the development of these competencies in K-12 and college education, the committee recommended reform in teacher education. Building on a practice-based approach, effective teacher education emphasizes foundational knowledge in development, learning, and knowledge-based pedagogy that is linked to extensive classroom experience, with mentoring by proficient teachers (Windschitl, 2009). Within coursework, faculty can promote deeper learning in the community through case-based methods, action research projects, performance assessments, and portfolio reviews (Darling-Hammond & Hammerness, 2005). As teacher candidates, faculty, and accomplished teachers examine and discuss teaching experiences and learning outcomes, there are rich opportunities to examine practice, revise understandings, and improve teaching. Learning in community also introduces pre-service teachers to the value of teacher social networks that can provide support, promote innovation and expertise development, strengthen teacher self-efficacy, and foster student achievement (Baker-Doyle, 2011).

When guided by an organizing framework, ePortfolios can be an ideal platform not only for capturing the complexities of this non-linear teacher development, but also for promoting teachers' adaptive expertise through reflection and feedback. As noted by Lambe, McNair, and Smith (2013), ePortfolios allow learners to demonstrate a commitment to lifelong learning and document growth related to professional standards. Additionally, reflection is often the central element of ePortfolio development (Yancey, 2009). By evaluating their own learning, teacher candidates create opportunities to extend their understandings (Dalal, Hakel, Sliter, & Kirkendall, 2012) and "directly engage in the scholarship of teaching" (Pelliccione & Raison, 2009, p. 273). The Hammerness et al. (2005) learning in community framework for understanding and guiding teacher development provides a useful structure for organizing the ePortfolio as a web-based learning community that is centered around reflective practice. This framework builds on professional standards that describe targets for competent novice teachers (Interstate New Teacher Assessment and Support Consortium; Council of Chief State School Officers, 2011) and for advanced teachers (National Board for Professional Teaching Standards, 2010). Furthermore, the framework draws from the teacher development literature in order to define and connect key components of teacher learning within a learning community of educators.

As explained by Hammerness et al. (2005), the learning-to-teach in-community framework begins with a central vision that presents images embodying the standards of high quality teaching practice and allows

teacher candidates to consider the goals of teaching and the process for ensuring that students reach those goals. Within an ePortfolio, the vision makes salient the goals of the teacher preparation program and sets the tone for capturing teacher candidate growth as teacher candidates reflect upon and question the disconnects between their previously held understandings about teaching and the images represented by the vision (Light, Chen, & Ittelson, 2012). Carried throughout the preparation program, reflective, vision-based ePortfolios help to build the coherence across teacher preparation necessary for enhancing teacher learning (Darling-Hammond & Hammerness, 2005).

Reflection continues throughout each component of teacher learning that is represented in the framework. Teacher candidates must develop deep understanding of what it means to teach, not only in terms of content and pedagogical knowledge, but also through intimate understanding of students and the social contexts of learning and knowledge transfer (Hammerness et al., 2005). Conceptual and practical tools, such as learning theories and instructional strategies, help teacher candidates enact their understandings. Further, these tools help teacher candidates establish their own developing set of teaching practices (Hammerness et al., 2005). Practices include teacher candidates' various approaches to instruction, such as engaging students in cooperative learning groups, developing unit plans, and designing formative assessments that drive feedback and further learning. ePortfolios allow teacher candidates to maintain an ongoing reflective commentary related to their learning processes across these components and thus develop a discursive narrative of their individual development over time (Ehiyazaryan-White, 2012; Pitts & Ruggirello, 2012).

The ongoing reflective commentary engendered by the ePortfolio is a key element of the critical dispositions teacher candidates must develop toward their roles as teachers within the learning in community framework. Central to these dispositions are an "inquiry stance" that focuses on reflection and an openness to learning and further developing one's teaching practice, as well as the persistence to ensure the learning and success of students (Hammerness et al., 2005). These dispositions mirror important tenets of adaptive expertise, such as asking questions (Schwartz et al., 2005), modifying knowledge and assumptions based on new information (Bransford et al., 2005; Lin et al., 2005; Schwartz et al., 2005) and engaging in problem solving that results in the selection of routine or innovative responses to the challenges of teaching practice (Crawford et al., 2005; Lin et al., 2007). Table 1 illustrates connections between learning in community components and aspects of ePortfolio design.

Central to the framework is an overall understanding that learning to teach occurs within the

Table 1
Relevance of Learning to Teach in Community Framework for ePortfolio Development

Web-based ePortfolio learning communities		
	Learning in community components	ePortfolio connections
Vision	Preparation program's images of what makes high quality teaching	Preparation program goals are clear across ePortfolio development with evidence of candidate reflection aligned to a central vision throughout
Understanding	Knowing what it means to teach	Stimulation of and space for ongoing reflective commentary across each component based on engagement with others within the web-based learning community that illustrates teacher candidate development across time
Tools	Conceptual and practical theories and strategies teachers use to act on their understandings of teaching practice	
Practices	Approaches to instruction	
Dispositions	Teacher candidates' understandings of their roles as a teachers with focus on being reflective and dedicated to student learning	

Note. Learning in community components adapted from Hammerness et al. (2005)

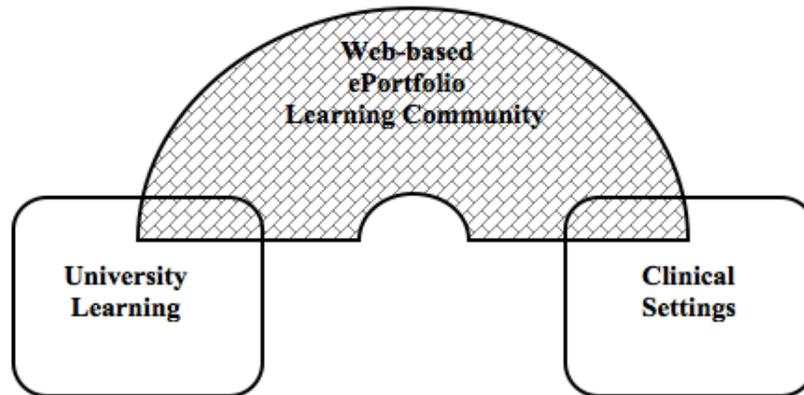
context of communities such as those developed among teacher candidate peer groups, teacher candidates and program faculty and/or school-based educators, and other combinations of teaching professionals. Learning communities can develop and change across various phases of the preparation program, and teacher educators can help orchestrate how learning communities encourage teacher candidates to embrace the program's vision of quality teaching and to develop the tools, understandings, practices, and dispositions necessary for effective teaching practice. Being learner-centered, ePortfolios establish an optimal learning-community environment for reflection because of their ability to stimulate dialogue that promotes the development of new ideas, learning, and thinking (Ehiyazaryan-White, 2012; Ring & Ramirez, 2012). Experienced teachers and program faculty can prompt candidate reflection and encourage the perspective-taking and desire for feedback characteristic of adaptive expertise (De Arment et al., 2013). Through purposeful design, teacher education faculty can establish ePortfolios as virtual learning communities that span the various contexts of teacher education and help establish program coherence (Darling-Hammond & Hammerness, 2005); ePortfolios can thus represent an essential bridge between teacher learning in university settings and teacher learning in school and clinical settings (see Figure 1; Hammerness et al., 2005).

ePortfolios: An Effective Medium for Ongoing Reflection and Feedback

Literature on the effectiveness of ePortfolios for promoting and assessing reflection informs the purposeful design of ePortfolios as web-based

learning communities for promoting adaptive expertise. Wetzel and Strudler (2006) sought the perspectives of teacher education students on the costs and benefits of using ePortfolios. Through semi-structured interviews, students and recent graduates ($n = 48$) described how they used reflection within their ePortfolios by connecting standards to theory and relating personal reactions to their own teaching activities (Wetzel & Strudler, 2006). Overall, students saw opportunities to reflect as a benefit of ePortfolio use. Further, these participants confirmed the value of ePortfolios for reflection, particularly in relation to their own teaching practices and to their understanding of what they might do differently next time (Wetzel & Strudler, 2006). Students surveyed ($n = 224$) by Parker, Ndoye, and Ritzhaupt (2012) echoed this positive sentiment, noting that ePortfolios promoted better understanding of their work and indicated areas in which they could improve their teaching effectiveness. Students, even those with the least experience with technologies and who gave negative feedback about ePortfolios and reflection, found their learning increased because they had to engage in frequent self-analysis (Parkes & Kajder, 2010). Lambe et al. (2013) examined threaded-discussion archives to gain insight into preservice teachers' perspectives on ePortfolio development. Students in their study ($n = 22$) noted clear emphasis on critical reflection through their ePortfolios over descriptions or summaries of events and artifacts (Lambe et al., 2013). Preservice teachers ($n = 8$) interviewed by Yao, Aldrich, Foster, and Pecina (2009) also noted value in the ePortfolio for developing their skills of reflection, but felt that specific reflection

Figure 1
Connecting Teacher Candidate Learning Between Higher Education and Clinical Settings



Note. The web-based ePortfolio learning community serves as a bridge between teacher candidate learning within the university setting and real world practice within clinical settings.

templates limited their free expression. In addition, these participants found that reflective tasks based solely on theory rather than teaching experiences did not allow for in-depth reflection (Yao et al., 2009). Teacher education faculty also expressed value in the ePortfolio as a tool for promoting student reflection (Yao et al., 2009). Strudler and Wetzel (2008) conducted semi-structured interviews with 64 faculty and administrators within six teacher education programs across the US to understand their perspectives on the use of ePortfolios within their programs. Respondents from all six sites cited the importance of reflection and learning that occurred through ePortfolios (Strudler & Wetzel, 2008). The significance that students and faculty attribute to ePortfolio-based reflection is critical for ensuring the buy-in and commitment of all participants within the web-based learning community. Illustrating the importance of bridging clinical and course-based learning, reflection that promotes learning and development and is tied to teaching experiences appears to be of particular value.

Research also points to the importance of scaffolding student reflection by providing specific prompts, feedback from faculty and peers, and detailed information on expectations and associated levels of reflective practice (Ehiyazaryan-White, 2012; Parkes & Kajder, 2010; Ring & Ramirez, 2012). Jenson (2011) analyzed her instructional approaches to promoting freshmen writing students' ($n = 137$) reflection and implemented instructional changes to encourage students to think more deeply about their learning. First, using surveys, Jenson (2011) gathered information on students' strategies for achieving their writing goals. Next, she put forth a conscious effort to make the purpose of each course activity clear to students through guiding questions and class discussion (Jenson,

2011). Finally, Jenson (2011) increased the course ePortfolio-based reflection requirement, asking students to post reflections for each paper throughout the semester, rather than a single reflection at the end of the course. Through qualitative analysis of students' final reflections across eight years of ePortfolio use, Jenson (2011) found that students wrote longer reflections that moved from simply naming and describing artifacts to discussing learning outcomes and self-regulating writing strategies. Students also increasingly related learning to other coursework and life beyond college in their reflections (Jenson, 2011). These findings suggest thoughtful instructional practices that scaffold student thinking can have a positive impact on depth and quality of student reflection.

A common theme across ePortfolio literature is the importance of feedback for promoting students' meaningful reflection through ePortfolios. As Ring and Ramirez (2012) noted: "The most effective and successful ePortfolio programs provide formative feedback throughout the ePortfolio development period, encouraging reflection and subsequent revision and refinement of the evidence" (p. 89). Through action research with seven master's degree students in education, Ehiyazaryan-White (2012) identified the importance of students being able to share and provide peer feedback on their successes, failures, and uncertainties through ePortfolio-based reflection. Faculty in teacher education programs, where reflection is extensive, cited emphasis on student participation "in a cycle of response and improvement" (Strudler & Wetzel, 2008, p. 138). Rather than reflecting on a single occasion in relation to an artifact or experience, engaging teacher candidates within a learning community that prompts further reflection encourages greater reflective depth. At institutions that did not

place heavy emphasis on reflection, students demonstrated surface level reflections involving description and some affective response. Unprompted, teacher candidates did not revise these reflections further, and thus did not engage in more extensive and thoughtful self-assessment (Strudler & Wetzel, 2008). This finding underscores the importance of targeted engagement among teacher candidates, program faculty, and practicing teachers within a learning community environment for the development of the ongoing reflective practice characteristic of adaptive expertise.

In addition to regular feedback and dialogic engagement with others, explicit expectations are important for promoting ePortfolio-based reflection. Faculty can communicate expectations clearly through thoughtfully developed reflection assessment rubrics. Parkes and Kajer (2010) developed a rubric to evaluate teacher candidates' reflection on practice and critical reflection of growth. Using their rubric, faculty award points across three levels—basic, competent, and distinguished—and students use stated criteria for each level to guide their reflective work. Use of rubrics such as this one helps students understand what reflection is and provides guidance rather than a prescriptive formula for developing reflective responses (Parkes & Kajer, 2010). Pelliccione and Raison (2009) also noted the improvement of first-year teacher education students' reflections in terms of depth and cohesion when they responded to a structured reflection guide.

Other rubric-based research targets the documentation of teacher candidates' growth in reflection through the ePortfolio platform. Pitts and Ruggirello (2012) studied the reflective practices of secondary science teachers ($n = 9$), specifically how they used baseline and post-baseline evidence to demonstrate growth within their ePortfolios. To analyze ePortfolio entries, the researchers used a scoring rubric with three levels of performance (1 = *under-developed*, 2 = *good*, and 3 = *excellent*) based on essential components of reflection: baseline and post-baseline evidence selected, application of a conceptual framework, and articulation of growth (Pitts & Ruggirello, 2012). With the support of a clearly articulated rubric and accompanying reading and writing guidelines, the students with the strongest entries were able to explain a conceptual framework and provide a clear rationale that connected the baseline and post-baseline evidence of their growth.

Research acknowledges the tension that exists between providing simultaneous structure and flexibility to support students' reflective practices through ePortfolios (Pitts & Ruggirello, 2012). However, by focusing reflection on the candidate's clinical and course-based experiences (Jenson, 2011; Wetzel & Strudler, 2006; Yao et al., 2009) and by providing explicit expectations through rubrics (Parkes

& Kajer, 2010; Pelliccione & Raison, 2009; Pitts & Ruggirello, 2012; Wetzel & Strudler, 2006) and ongoing feedback (Ring & Ramirez, 2012; Strudler & Wetzel, 2008), teacher education faculty can enhance the depth and quality of candidate reflection. In turn, enhanced skills in reflection suggest development of critical metacognitive skills for adaptive expertise.

Developing an ePortfolio-Based Learning Community

In this section, we describe our ePortfolio design based on the adaptive expertise and reflection literature, our accomplishments to date, and our plans for further implementation and evaluation. While this ePortfolio model was developed to meet the preparation needs of special educators through collaboration with experienced teachers, the design process and the implementation and evaluation model could be applied to other teacher preparation programs.

Design Process

Our ePortfolio development team, including faculty and doctoral students from three special education preparation programs, the director of assessment, and the director of technology, started the design process two years ago to create an ePortfolio model based on professional standards (Council for Exceptional Children, 2008), with opportunities for faculty-teacher candidate review of artifacts and reflections. Although each of the three programs required teacher candidates to assemble portfolios of artifacts and graded rubrics during their programs of study, teacher candidates commented on the tedious process of organizing these portfolios. In addition, faculty were concerned about the repetitive and generic nature of candidates' reflections. To ensure a sound conceptual basis and a feasible web-based design, team members reviewed the literature on teacher development and ePortfolios.

To clarify the conceptual and professional-standards framework for the ePortfolio, the team also examined the programs' clinical evaluation, which guides and documents teacher candidates' performance within their final clinical experiences. Across five teaching standards on the Clinical Evaluation Continuum, target performance is described as "building on reflection, changing to improve, adjust, expand, and connect," descriptors that are consistent with adaptive expertise constructs. Faculty acknowledged the need to scaffold this level of reflection throughout teacher candidates' programs of study and established the promotion of meaningful reflection as a central goal in examining the curriculum and designing the ePortfolio process.

Following the review of various platforms for ePortfolios (Watwood, Nugent, & Deihl, 2009), we selected WordPress as the blogging tool based on its flexible format and the potential for promoting deeper learning outcomes through feedback and reflection (Palloff & Pratt, 2007). In addition, the university provides WordPress technical support for students and faculty. Once the department created an ePortfolio template and training resources, the basic ePortfolio was piloted with teacher candidates.

Reflection Prompt Development

To apply the conceptual model of adaptive expertise and the learning in community framework, the ePortfolio team considered the important role of effective teachers who supervise teacher candidates within their classrooms, model adaptive expertise, and scaffold teacher candidates' reflection and growth. With their first-hand knowledge of the everyday challenges of practice, the exemplary teachers' perspectives about teacher candidates' challenges were critical to informing our development of reflection prompts for the ePortfolio model. Through a grant from the university's Center for Teaching Excellence, our team implemented the next phase of ePortfolio model development with exemplary special educators, who were teaching in local schools and community programs. Faculty identified seven program graduates

regarded as accomplished educators who represented the diversity of roles and educational settings that our special education teacher candidates need to understand. Specifically, these educators' roles included early interventionist, early childhood special educators, special educators, and school psychologist, with three to 18 years' experience. Their educational environments ranged from homes and community preschools to public schools and private day settings, with a range of inclusive and self-contained models of service delivery. All of these educators had experience as formal or informal mentors and supervisory professionals.

Guided by ePortfolio team members, these educators reviewed literature about adaptive expertise and reflection as the first step in the initial alignment activity to associate adaptive expertise indicators (De Arment et al., 2013) with target performance outcomes on the Clinical Evaluation Continuum rubric and specific ePortfolio artifacts (performance assessments conducted throughout the program of study). To build a shared vision for adaptive expertise in teaching, these educators were asked to identify one of the portfolio artifacts of particular relevance to their practice and the challenges of learning to teach. Prompted by these artifacts (identified in Table 2), educators discussed their own teaching, describing their challenges and problem solving approaches. Later, ePortfolio team members used a specific protocol based on adaptive

Table 2
Alignment Activity

ePortfolio Artifact	Clinical Continuum Target Exemplar	Adaptive Expertise Indicators
Individualized Education Plan	Reflects on learning goals, linking clearly to intervention, and setting high expectations.	Using causal and hypothesis-based reasoning; selecting routine or adaptive approaches based on data and hypotheses.
Individualized Family Service Plan	Encourages family/caregiver involvement as a team member in planning, delivering, and evaluating services.	Seeking and analyzing feedback from others; accounting for multiple perspectives.
Functional Behavioral Assessment	Monitor child's behavior throughout day, selecting strategies that prevent or lessen disruptive behavior.	Being motivated to problem solve; monitoring results and performance and modifying existing procedural skills.
Cultural Diversity Research Project	Actively seeks out other perspectives; appreciates their point of view; may adjust own view upon reflection.	Willing to ask questions; willing to replace prior assumptions and understandings; accounting for multiple perspectives.
Learning Environment Analysis	Reflects on time management effectiveness, adjusts routines, adopts new plans to maximize child engagement, coaches others in embedded interventions.	Inventing new procedures and balancing efficient and innovative approaches; using data and hypotheses to drive problem solving.
Tutoring in Reading Notebook	Uses varied materials to build on student's prior knowledge, interests, needs; reflects and makes changes based on research and students' needs.	Having the inclination to learn rather than simply apply knowledge; responding to variability in the classroom.

Note. Adaptive Expertise Indicators adapted from De Arment et al. (2013).

expertise to prompt reflection on their teaching practice (see Appendix). These discussions were audio recorded for further analysis based on adaptive expertise constructs.

Next Implementation Steps

Analyses of educators' reflections will be used to characterize specific teaching practices and tools within the adaptive expertise framework. Following ePortfolio team discussions about these analyses, accomplished educators, doctoral students, and faculty will develop specific reflection prompts to scaffold teacher candidates' use of specific cognitive and metacognitive skills and of adaptive dispositions across the selected ePortfolio artifacts. These prompts will be designed to support candidates' deeper understanding of teaching and to foster habits of collaboration and problem solving that will sustain their development as teachers. In addition, faculty will update existing associated rubrics for these artifacts to incorporate the specific adaptive expertise indicators aligned with the program standards and clinical continuum.

Faculty will identify seven teacher candidates to partner with the accomplished special educators in the prompt development process. Through face-to-face discussions, teachers will prompt candidates' reflection about the specific artifacts. These discussions will be audio-recorded and analyzed based on adaptive expertise constructs. Teacher and candidates' experiences in the face-to-face discussions will inform revisions to reflection prompts before they are implemented in the ePortfolio platform.

Transitioning from face-to-face dialogue to web-based discussions, teacher candidates will complete each course assignment as they progress through their programs of study. Once they load their artifacts into their ePortfolios, experienced special educators and program faculty will engage with teacher candidates using the ePortfolio platform to prompt and probe teacher candidates to extend their thinking about the assignment in order to develop adaptive skills and dispositions in relation to real world practice. Performance on the updated rubrics will be assessed for evidence of adaptive expertise tenets in teacher candidates' responses to the reflection prompts.

Model Evaluation Plan

Candidate assessment data and evaluation data, together, will be used to determine the effectiveness of the ePortfolio-based learning community for prompting reflection to promote adaptive expertise. The content of special education teacher candidate reflection prompts, feedback from faculty and accomplished special educators, and rubric performance will provide

evidence of candidates' use of the skills and dispositions for adaptive expertise. Participants (i.e., teacher candidates, accomplished special educators, doctoral students, and faculty) will provide feedback through surveys and focus groups on the content of the reflection prompts, the ePortfolio format for reflection and feedback, and the experience of engaging in a professional learning community. Based on analysis of the assessment and evaluation data, the ePortfolio team will revise the reflection prompts, the feedback process, and the structure of the ePortfolio and web-based learning community. Subsequent investigations will include validity studies to analyze the reflection prompts to generalize this process in supporting the development of adaptive expertise in clinical experiences and subsequent job performance.

Conclusion

This paper offers a framework for using ePortfolios to build a web-based learning community that promotes special educator development, emphasizing deeper learning through reflection and the development of adaptive expertise. Collaborative work, ongoing communication, reflection prompts, and feedback are enhanced by online tools that support the learning-to-teach-in-community model for teacher development (Hammerness et al., 2005). Within the web-based learning community, special education teacher candidates practice the skills and dispositions for adaptive expertise through ongoing reflection based on real-world classroom cases and feedback from special education practitioners and faculty.

This ePortfolio model creates opportunities to: (1) engage teacher candidates in unique learning community-based experiences with faculty and proficient teachers in the P-12 education community, (2) improve pedagogy to enhance teacher candidates' preparation and development of adaptive expertise, and (3) contribute to the scholarship of teaching and technology. Specifically, prompting reflection in alignment with national standards and adaptive expertise concepts can be embedded sequentially throughout the teacher candidate's program, promote critical engagement with content and pedagogical knowledge, and provide an interactive community platform for faculty and advanced professionals' mentorship and shared vision about teacher development. For teacher candidates, reflection prompts from proficient special educators provide an opportunity to investigate real-world decision-making scenarios that often arise in P-12 special education classrooms; thus, they will be able to extend and apply knowledge and skills to classroom challenges for more adaptive and effective teaching. Findings from assessment and evaluation data from the

implementation of the ePortfolio-based learning community model have potential implications for promoting quality reflection, designing web-based learning communities, and structuring the ePortfolio as a platform for web-based learning communities.

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SERRA T. DE ARMENT is a doctoral student at Virginia Commonwealth University (VCU) pursuing a

degree in Special Education and Disability Policy. Her research interests include teacher preparation, teacher quality, collaborative teaching, and teacher retention in special education.

ANGELA P. WETZEL, PhD, serves as Director of Assessment and as a member of the Department of Foundations of Education at VCU. Her research interests include best practices for instrument development, student assessment, and program evaluation as scholarship.

EVELYN REED, PhD, is an Associate Professor in the Department of Special Education and Disability Policy at VCU. Her primary research interests are teacher educator and personnel development in early intervention and special education. With colleagues, she has led personnel development models at the pre-service and in-service levels, emphasizing interdisciplinary collaboration, community-engagement, and high-needs environments.

Appendix
Discussion of Teaching Experience Related to ePortfolio Component Protocol

- In general, in what ways do you see this [particular assignment] relating to your work as a special educator practitioner?
- Can you talk with us a little bit more by walking us through a specific example of this [assignment] in your practice?
- How did you develop your approach? Where did you learn about it?
- How did the variability across your students influence your plans? What options did you consider?
- How well prepared did you feel?
- Did you encounter anything unexpected?
- Did you change your plans? Why? In what ways?
- What made this effective? How did you know?
 - a. If team related: Did you get feedback from colleagues or family members?
 - b. What role did data play in understanding effectiveness?
- What are your best resources for solving problems in teaching?
 - a. Did you consult with colleagues or others? If yes, can you describe?

Based on what you've been describing about this particular assignment, in what ways can you prompt a teacher candidate to do this kind of thinking – to think more deeply, more broadly, more creatively? Teacher candidates develop their assignments around one finite example, how can we get them thinking about the complexity of real world practice?