Title: Expanding the learning network: How teachers use Pinterest

Abstract: This exploratory qualitative study of 117 teachers explores how educators engage with Pinterest, an online social networking site, specifically asking (1) What similarities and differences exist in how elementary level pre-service and elementary level in-service teachers engage with Pinterest? and (2) What similarities and differences exist in how secondary level in-service teachers and elementary level in-service teachers engage with Pinterest? Findings indicate teachers at all levels tend to use Pinterest to search for educational resources and adapt resources to suit their classroom needs. Pre-service teachers identify a more complex interaction with Pinterest than in-service teachers when determining quality resources. Findings indicate a need for future research into teacher education practices and the complex interactions pre-service teachers engage in with Pinterest resources.

Keywords: teaching, social media, Pinterest, elementary, secondary

Introduction to the Problem

Social media has impacted nearly every aspect of public life in the 21st century, including education. Some impacts have been decidedly negative such as the proliferation of "fake news" (McGrew, Ortega, Breakstone, & Wineburg, 2017), while others have encouraged positive outcomes for teacher professional learning and advocacy (Carpenter, 2016; Carpenter, Cassaday, & Monti, 2018). Social media platforms, for example, have encouraged teacher collaboration and leadership through informal professional development (Carpenter, 2016; Kerr & Schmeichel, 2018; Scholastic, 2014). These platforms have also encouraged organized teacher protests, as seen in the international Opt Out movements (Author, 2016) or protests for increased educational funding in the United States (PBS NewsHour, 2018). By democratizing professional learning, social media platforms have encouraged communication among teachers regardless of proximity and enhanced their access to curriculum materials (McKnight et al., 2016). With a myriad of resources including Teachers Pay Teachers, microblogs, and Twitter chats, it is no wonder that a 2014 survey of U.S. teachers discovered that 57% of respondents connected with other educators using technology (Carpenter, 2016).

With the near ubiquity of social media in contemporary life, Carpenter and Krutka (2014) posit that researchers should consider effective and judicious social media use by teachers. In this paper we take up this concern by investigating how teachers make use of an understudied social media networking site, Pinterest, a site that acts as "an online scrapbook...a management tool, virtual pinning board, a tool for digital curation, and a collaborative learning hub" (Grote-Garcia & Vasinda, 2014, p. 37). To date, much has been written about how educators might use Pinterest to enhance their teaching, but little empirical research—qualitative or otherwise—has been published exploring how educators actually use the site. An exploratory study investigating

how teachers at the in-service and pre-service level is necessary to serve as a foundation for future research. Thus, we conducted a qualitative study investigating the following research questions: (1) What similarities and differences exist in how elementary level pre-service and elementary level in-service teachers engage with Pinterest? and (2) What similarities and differences exist in how secondary level in-service teachers and elementary level in-service teachers engage with Pinterest? To answer these questions we focus specifically on teachers' purposes for using Pinterest, the types of adaptations teachers make to Pinterest resources, and how teachers determine quality resources on Pinterest. An overview of the research literature, the theoretical perspectives influencing this work, and the research methodology guiding the study follows below.

Literature Review

In its seven-year lifespan, Pinterest has experienced rapid growth, with 175 million active users as of 2017 (Carpenter, Cassaday, & Monti, 2018), many of whom are women (Joyce, 2015). In 2014, the site was one of the top five websites educators used for professional development (Rayburn, 2014). According to some reports, "Education-related items are the second-most highly searched resource" on Pinterest (Hunter & Hall, 2018, p. 634; Mittal, Gupta, Dewan, & Kumaranguru, 2013). Pinterest is meant to be used actively and the "repinning" feature encourages users to share other users' pins (Wilkinson, 2013). For this reason, Grote-Garcia and Vasinda (2014) claim that social media offer "a convenient and powerful venue for teachers to connect to one another" (p. 37). Indeed, social media sites can contribute to the formation of teachers' social capital (Rehm & Notten, 2016) and enhanced professional practices (Carpenter & Green, 2017).

As Pinterest has risen in popularity, so too have publications suggesting how teachers might use Pinterest for educational purposes, including "promoting new books, celebrating particular genres, or sharing nonfiction titles on various subjects" (Baker, 2013, p. 74), developing students' media literacy skills (Gammon & McGranahan, 2015), promoting "higher levels of engagement, increased relevancy, and improved differentiated instruction" (Giebelhausen, 2015, p. 39), expanding personal learning networks (Herbert, 2012), and simply storing online resources (Huber & Bates, 2016). Others provide detailed descriptions of how professors, librarians, and other educators have used Pinterest in their own contexts (Grote-Garcia & Vasinda, 2014; Schoper, 2015; Pearce & Learmonth, 2013; Shellenbarger, 2013; Wagner, 2014). These articles are essential, as Pittard (2017) reports that some teachers turn to Pinterest out of desperation for curricula due to changing state and national standards.

Despite the site's usefulness to connect teachers to one another, observers have questioned the abundance of "cute" or "fun" pins populating Pinterest, leading to a range of warnings against the use of Pinterest for its lack of coherence, inaccuracy, or outright lack of academic value (Huber and Bates, 2016; Miller, 2015). One reason for such caution is that a curriculum designed from Pinterest may lack coherence that would otherwise be found in a textbook or standards-based curriculum (Greene, 2016). Moreover, content analyses of resources on Pinterest suggest that inaccurate information is often present within teacher-made lesson plans and ideas on the site. For example, Hertel and Wessman-Enzinger (2017) claim that "the Pinterest curriculum is shallow" (p. 7), based on pins' "infrequent use of real-world context" as well as "mathematical errors in roughly one-third of pins" (p. 1). Gallagher, Swalwell, and Bellows (2018) have also pointed this out in the field of elementary social studies, claiming that much of what is found on Pinterest is "toxic." They provide teacher candidates in their

preparation courses with a social studies specific flowchart to determine if a source is so problematic it must not be used or if it might be improvable. In an exploratory study, they find that their students continue to misidentify problematic resources on Pinterest even after they are taught to use the flowchart (Gallagher, Swalwell, & Bellows, 2018). Other small-scale studies (Carpenter et al., 2018; Irvine, 2015; Torphy & Hu, 2016) have sought to understand how teachers use Pinterest. Given the warnings to teachers against using the site for instructional purposes and yet the overwhelming popularity of it across the globe, Carpenter et al. (2018) call for more research into teachers' uses of Pinterest, as there exists a clear lack of knowledge around this topic. This study fulfills that call for additional research and provides an initial knowledge base from which future research may be conducted.

Theoretical Framework

This study was guided by the theory of connectivism. Connectivism, in short, is a "theory of learning that emphasizes the importance of networked information resources throughout the process of learning" (Dunaway, 2011, p. 675). Connectivism is closely related to the rise of technology in the 21st century and the foundations of knowledge that result (Siemens, 2005). Key tenets of connectivism include the belief that learning occurs within a diverse range of thought, that learning can take place in connection with technology, that the ability to know—not what is known—is most critical, and that learning occurs through the act of making decisions (Siemens, 2005, n.p.). Connectivism "acknowledges the role of information technology in the processes of accessing information from multiple sources" and takes into account how certain information technologies can limit or expand the types of information available to learners (Dunaway, 2011, p. 675). For this reason, "the ability to draw distinctions between important and

unimportant information is vital" (Hertel & Wessman-Enzinger, 2017, p. 3). With the rise of information technologies, the ability to discern quality resources is of the utmost importance.

Within this framework, individual learning communities exist as connected nodes making up a broader network through which knowledge is distributed (Goldie, 2016). These nodes are constantly in flux. Hertel and Wessman-Enzinger (2017) assert that if Pinterest is viewed as a network of connected nodes, then the "core elements of Pinterest are continuously being transformed" (p. 2). Connectivism helps us to see how an individual's activity is never performed in a vacuum (Fleer, 2015), and the spaces for learning go far beyond the linear exchange from teacher to student. Bell (2011) elucidates this point by arguing "that theories of learning based solely on assumptions of students being taught by teachers, usually in a classroom, do not provide an adequate framework for us to think and act in the digitally saturated and connected world in which we live" (p. 100). Thus, scholars must look to the learning networks that continue to educate teachers long after formal instruction occurs in colleges of education or professional development programs. Thus, connectivism serves to justify a study of how teachers use Pinterest.

Methods

While making use of a connectivist theoretical framework to understand the data collected, we also acknowledge the social constructionist epistemological orientation that informed this study's methodology. All learning is social and enriched by social interaction (Land, Hannafin, & Oliver, 2012). Social constructionism rests on the assumption that "humans interact with other humans and with artifacts in the world and naturally and consciously attempt to make sense of those interactions" (Jonassen & Land, 2012, p. ix). Believing that knowledge is constructed and created between individuals, "the world and objects in the world," (Crotty, 1998,

pp. 43-4), this study assumes that differently-positioned individuals would "know and value different things" (Weinberg, 2014, p. 18). Thus, we designed a qualitative study (Merriam & Tisdell, 2016) involving open-response survey data that explored how differently positioned individuals interacted with a social media site. The findings presented here are not generalizable nor are they representative, and our data was not collected randomly. Indeed, social constructionists would not espouse that a universal truth exists. Despite these limitations, this research addresses a knowledge gap in the field of educational research, providing foundational understandings of how some pre-service teachers (PSTs) and in-service teachers (ISTs) make use of Pinterest, understandings we believe will be useful to teacher educators as they approach educating teachers on how to navigate emerging and unvetted sources. Just as Carpenter & Krutka (2014) assert in their study of teachers' uses of Twitter, we "present our results so fellow educators and researchers might further interpret findings in light of their experiences, research, and situations" (p. 420).

Data Collection

Our three-person research team developed a 29-question survey (see Appendix A) designed so that participants' exposure to forthcoming questions was determined based on their preceding responses. We chose surveys as our data collection method as we believed it would maximize the range of responses we would gather. In an examination of data collection instruments, we found none that were appropriate for our purposes. As a result, survey questions were written collaboratively by the three authors in order to collect a host of data, including demographic data as well as the social media typologies of Pinterest users (Brandtzaeg, 2012). We also designed questions based on our reading of the extant scholarship on teachers' uses of Pinterest, writing questions to explore in more depth the assertions set forth by researchers that

were yet to be empirically proven. For instance, the literature suggests that teachers consume Pinterest without critique. Thus, we asked questions to investigate whether teachers did, in fact, use Pinterest, what resources they sought out when on the site, and whether they made modifications to those resources. The survey, hosted by Qualtrics, started with an informed consent document that outlined security and privacy issues. We collected both demographic data and qualitative free-response data. Each member of the research team distributed the online survey link via Facebook, Twitter, and email to personal and professional networks through a method of snowball and convenience sampling (Creswell, 2013). Links were shared with networks such as the Association of Teacher Educators, the American Educational Research Association's Teaching and Teacher Education division, and the National Association for Multicultural Education. Personal networks of teachers were concentrated in the Southeastern United States. Teachers and teacher educators in our networks subsequently shared the survey with members of their school communities and professional networks. Due to our use of snowball sampling on social media and personal email, it is not possible to determine the response rate.

Demographics

Our data come from 117 survey respondents who used Pinterest to inform their instruction. Less than three percent of all respondents were male-identifying (n = 4); the vast majority of responses came from female-identifying teachers (n = 113). Responses came from 38 PSTs and 79 ISTs (Figure 1). Originally, 41 PSTs were included, but of these, only three taught at the secondary level; due to this limited sample size, their data were not used for this study. Of the 79 ISTs, 39 were elementary level (Grades PK-6) and 40 were secondary level (Grades 7-12). PSTs (n = 38) represented five teacher preparation programs in the United States, although

the majority were concentrated at one southeastern research-intensive university. Many ISTs explained that they taught a range of grade levels and subject areas, which forced them to indicate their grade level taught as "other." For example, one teacher taught students with autism from the kindergarten to third grade level. Another taught ninth and eleventh grade English, as well as German for grades nine through twelve. ISTs taught in nine (mostly southeastern) states. Although a range of experience was represented, most ISTs had taught for less than ten years (n = 52).

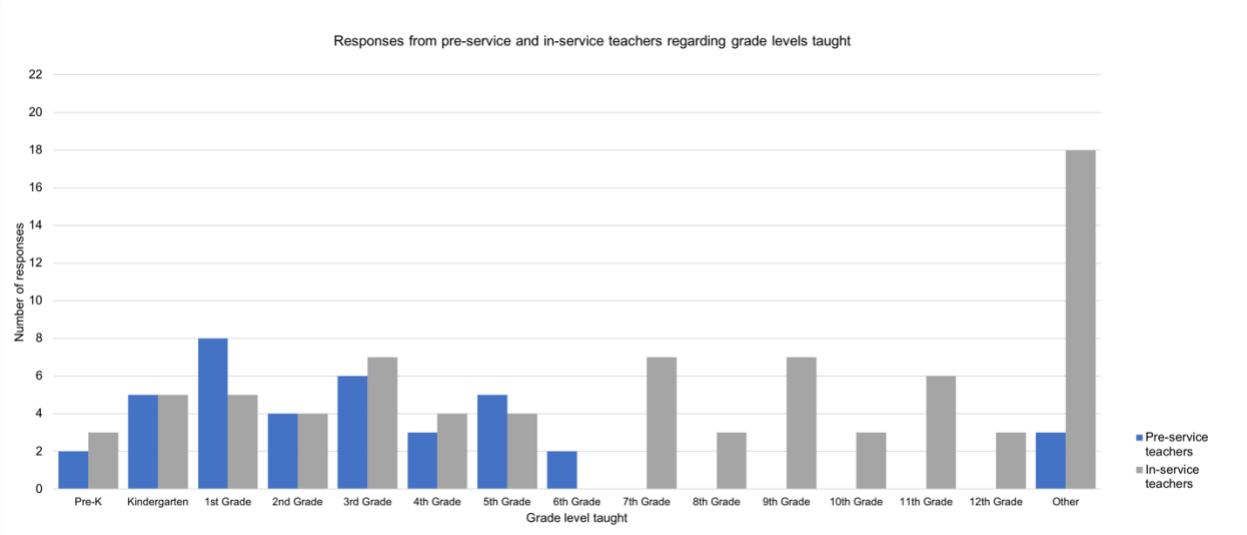

Figure 1. Grade-Levels Taught By Participants

Data Analysis

To analyze the qualitative survey data the research team initially followed Spradley's (1979) domain analysis to complete first-cycle coding (Miles, Huberman, & Saldana, 2014). Domains were identified deductively from our survey questions, although themes emerged inductively within those larger domains. Each researcher coded independently, created a table to separately list domains and categories for PSTs and ISTs, and then wrote brief paragraphs describing the similarities and differences across three of the identified domains. Paragraphs,

codes, and categories were then compared across the three researchers to promote credibility across our findings (Tracy, 2010).

A process of second-cycle coding (Miles et al., 2014) followed, in which two researchers integrated first cycle codes into a more refined list of codes under three domains of interest (purposes for using Pinterest, types of adaptations made to resources, and how teachers determined a quality resource). Survey data was broken into three datasets (elementary level PSTs, elementary level ISTs, and secondary level ISTs). Two researchers then re-coded the survey data using the second-cycle codes and organized data into matrices. As a check on the coding process, the third researcher independently analyzed the data and organized data into separate matrices. Upon completion of the third researcher's analysis, the three researchers compared both sets of coded data in a corroboration session. Inconsistencies in coding were discussed at length until all researchers agreed on appropriate categorization. In order to avoid using terms such as "most" or "many" when writing about qualitative data, we have used numerical counts for specificity. This process of quantifying our data served as a check on our analysis process, as we were able to identify whether patterns we believed were represented in the data were, in fact, patterns (Maxwell, 2010; Sandelowski, Voils, & Knafl, 2009). Furthermore, providing simple counts of qualitative data has supported the internal generalizability of our qualitative analysis (Maxwell, 2010). We do not claim external generalizability; instead our findings represent a robust portrait of the ways in which some, but not all, teachers use Pinterest.

Results

Results of this study provide insight into both PST and IST engagement with Pinterest. Specifically the similarities and differences between elementary level (grades PK-6) PSTs and

ISTs, as well as the similarities and differences between elementary and secondary (grades 7-12) ISTs are discussed. The findings are organized around three areas of interest: 1) teachers' purposes for using Pinterest, 2) adaptations made to Pinterest resources, and 3) determining quality of Pinterest resources. Following the findings, a discussion and implications for future research are presented.

Purposes for Using Pinterest

Elementary Level Pre-Service and Elementary Level In-Service Teachers

Elementary PSTs and ISTs pervasively identified "idea gathering" as a main purpose for using Pinterest (Figure 2). Both elementary level PSTs and ISTs indicated they gathered ideas for items such as project-based learning, anchor charts, worksheets, science explorations, workstations, crafts, opportunities for differentiation, and creative ways to save money as a teacher. Moreover, both PSTs and ISTs noted they predominantly used Pinterest as a tool to cultivate ideas related to content, instructional tools, classroom environment, and engagement.

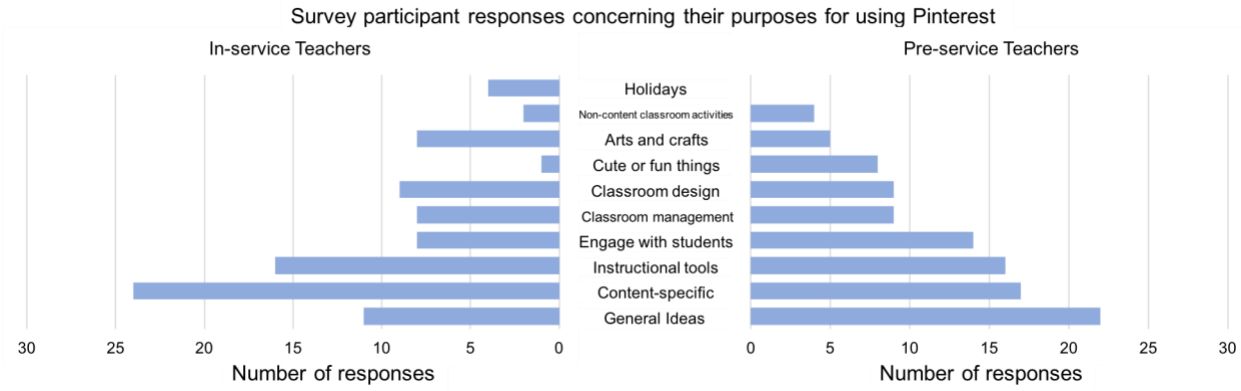

Figure 2. Pre-service and in-service teacher uses and purposes for using Pinterest

There were 41 instances in which elementary participants indicated they searched for ideas on Pinterest related to specific content areas. Teachers indicated their searches consisted of content focused on math, science, and social studies; however, ideas pertaining to English Language Arts (ELA) were the most sought out. Teachers searched Pinterest to find general

ideas related to ELA content, but they also searched "for inspiration in designing weekly literacy centers," or to identify "ways to structure guided reading groups." One elementary PST shared she specifically searched Pinterest for "independent practice activities for certain skills, such as segmenting phonemes… or suggestions for children's literature. For example, 'children's books about poverty' or 'best children's books for kids who hate reading.'"

Elementary PSTs and ISTs (n = 32) also indicated that they used Pinterest to find tools and strategies to support instruction. While some teachers stated they searched for worksheets on Pinterest, the majority of elementary teachers indicated they used Pinterest to find templates of graphic organizers, foldables, and anchor charts. Throughout the survey teachers referenced using Pinterest to find examples of anchor charts to support standards instruction 20 times. One IST at a state-identified low-performing school shared her use of Pinterest to supplement the school's required curriculum:

> [Our District] has a program for low performing schools...I am told the exact anchor charts I must have. Many times, their ideas are taken straight from Pinterest. Other times, their charts are awful, so I find I am using Pinterest to make my own [anchor charts].

In addition to seeking out instructional tools such as anchor charts, elementary PSTs and ISTs used Pinterest to find resources to enhance the classroom environment. In total, a combined 35 elementary ISTs and PSTs mentioned seeking pins related to the classroom environment. These responses focused on ideas connected to classroom organization and design, as well as classroom management. Both PSTs and ISTs noted they used Pinterest to gain ideas about designing and organizing the physical space in the classroom. Teachers stated they sought out "organizational tips" and "storage solutions" to enhance their classroom environment. While a few indicated they looked for room decorations and "visual aesthetics," one PST explicitly stated

she sought out “classroom designs with education in mind.” Coupled with the organization of the classroom environment, PSTs and ISTs referenced Pinterest searches for management “tips” and “techniques” with a specific focus on behavior management strategies. Elementary teachers also noted they sought out checklists and anchor charts focused on behavior management strategies and social skills.

Finally, elementary PSTs and ISTs stated they used Pinterest to enhance student engagement. They looked for ideas from other teachers that they perceived to be more creative or who used different activities to teach “boring” content. Participants also sought to “find engaging activities to meet the standards,” as well as to find “hands-on activities.” One IST shared, “I look for activities and hands-on ways to teach math and reading topics… to get the children moving and working in cooperative groups rather than sitting at their desks completing a worksheet.” Despite repeatedly mentioning hands-on engaging activities, these terms went unexplained in our data, leading us only to speculate what the use of these activities might look like in the classroom.

Whereas there were various similarities across the elementary PSTs and ISTs, only limited differences emerged among their uses for Pinterest. One key difference was the specificity of stated use. IST responses to questions related to the purpose and use of Pinterest generally contained greater details about their specific use of items found. ISTs more consistently noted specific academic content they obtained from Pinterest, and appeared to engage in strategic searches to find resources to supplement existing curriculum. Conversely, most PSTs indicated they gathered general ideas related to the classroom environment and student engagement that they filed away for future authentic teaching opportunities. Coupled with this pattern was the recognition of using Pinterest to search for “cute and fun” ideas. While

eight PSTs noted they used Pinterest to find “fun activities” and “cute graphics,” only one IST referenced searching for “cute craft and speech ideas to go with my thematic units.” Other than this discrepancy, we found no substantial qualitative differences between ISTs’ and PSTs’ purposes for using Pinterest.

Elementary Level and Secondary Level In-Service Teachers

On the surface, elementary ISTs and secondary ISTs purposes for using Pinterest appear to be similar, as both groups indicated they use Pinterest as a resource to find instructional tools (n = 16), gather and collect ideas (n = 18), and identify content related materials (n = 7) (Figure 3). However, the items secondary ISTs searched for varied from those of their elementary counterparts. Secondary teachers referenced seeking out materials that directly connected to their specific content areas and courses. Teachers noted searching for specific items such as primary sources readings, novels, world maps, content specific websites (i.e. French news), and interactive math notebooks. In particular, a secondary art teacher shared how she uses Pinterest to collect artwork to serve as exemplars within her Art Honors course.

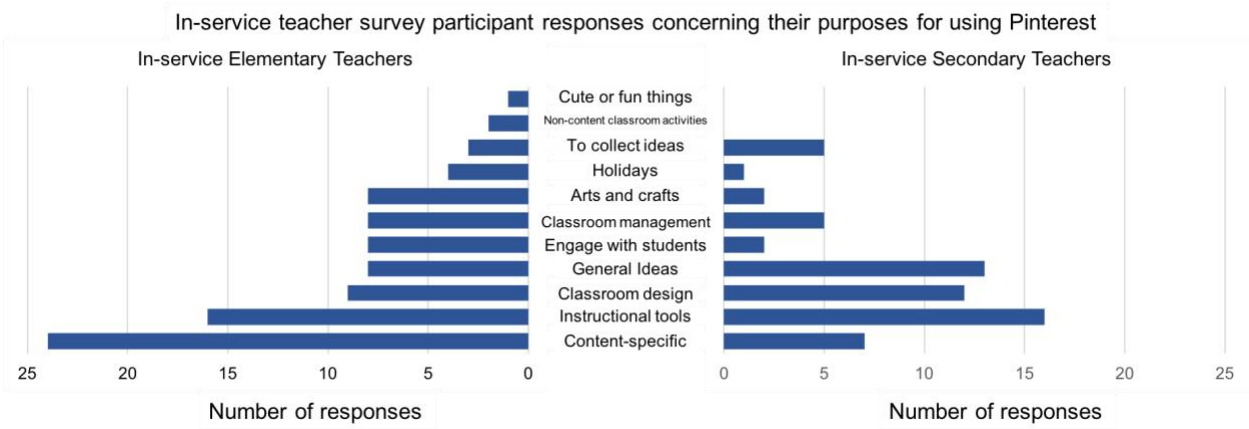

Figure 3. In-service teacher uses and purposes for using Pinterest

Similar to the elementary ISTs, 17 secondary teachers indicated they used Pinterest to find resources to enhance the classroom environment. Twelve individuals specifically focused on

gathering ideas connected to classroom organization and decor, and five sought out ideas directly related to behavior management. Whereas the elementary teachers were specific in their descriptions of searches related to classroom environment, secondary teachers remained quite vague.

One particular difference that emerged between elementary ISTs and secondary ISTs was the use of Pinterest to search for items not directly related to content. Within the elementary teacher responses there were responses that indicated Pinterest was used to search for crafts (n = 8), holiday items (n = 4), and ideas that were deemed "cute and fun" (n = 1). However, within the secondary teacher responses there were a limited number of teachers noting they used Pinterest to search for crafts (n = 2) and holiday items (n = 1), and no participants referenced searching for items that were "cute" or "fun."

Adaptations Made to Pinterest Resources

Elementary Level Pre-Service and Elementary Level In-Service Teachers

When analyzing elementary PST and IST responses to questions focused on adapting ideas found on Pinterest, the majority of participants indicated they made various adaptations to the resources found on Pinterest (Figure 4). Of the 77 elementary teachers represented, only four PSTs and one IST indicated they do not make adaptations to the resources or lessons found on Pinterest. For the remainder of the participants, the majority of adaptations focused on meeting student needs and attending to grade-level standards.

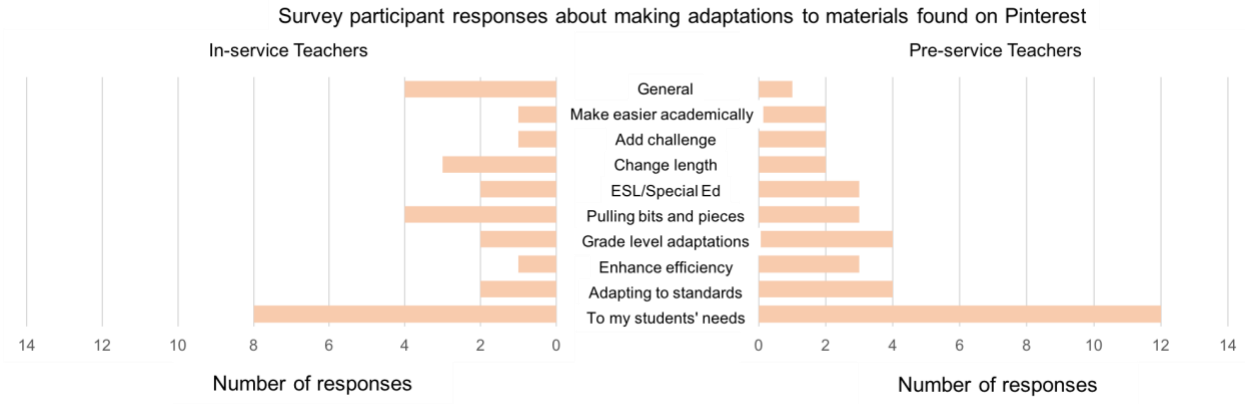

Figure 4. In-service and pre-service teacher responses concerning the adaptations they make to Pinterest materials.

PSTs and ISTs shared a variety of ways they adjusted Pinterest to meet the needs of their students. Twenty teachers mentioned making adaptations towards "meeting my students' needs." Participants discussed adding visuals, choosing different texts, incorporating technology, and changing lesson formats to better attend to the context of their classroom. One teacher shared, "I have adapted the anchor charts to include relevant examples that relate to our school or what we are teaching so my students have a better connection." Several participants indicated their adaptations focused on broadly meeting the ability levels of the students in their classrooms.

Other teachers noted they made adaptations to challenge students or make the content easier. Teachers discussed their adaptation of reading levels, integration of higher-level questions to encourage critical thinking, and the addition of resources to scaffold multiple classroom levels. One PST shared how she added a vocabulary definition sheet to a math center found on Pinterest, which she included to support students that may not have had a thorough comprehension of the mathematical language used in the center. Very few teachers mentioned adapting resources for students identified as special education or English language learners. Only two ISTs and three PSTs directly mentioned these student populations.

Between both data sets, 15 teachers specifically discussed Pinterest adaptations to better attend to state- and grade-level standards (i.e. adapting to standards, grade level adaptations, and making it easier academically). Participants were cognizant that Pinterest resources needed to align with their state standards and noted that they consistently made changes to "better fit [state] standards" and to "base it [lessons] on the grade-level skills" students are learning. In particular, one PST stated, "Always adaptations! I have to link the idea to the standards and education, figure out what parts [of the resource] I want to use, and what parts [of the resource] I don't want to use."

Elementary PSTs and ISTs did not indicate noticeable differences in their adaptations of Pinterest resources. However, ISTs more frequently reported a confidence that allowed them to adapt ideas in a manner that made sense to them professionally. For example, ISTs mentioned they would tweak ideas during the course of instruction, rearrange content, and make inferences from Pinterest pins based on their student data. ISTs were also more specific in their explanations for adapting ideas. From adapting a lesson structure to incorporate the gradual release model to modifying a contractions lesson to better fit the needs of 2nd graders, ISTs were more apt to articulate their reasons for adaptations. Additionally, ISTs provided more specific examples of instances in which they adjusted resources and reasons for doing so.

Elementary Level and Secondary Level In-Service Teachers

Similar to the elementary ISTs, the majority of secondary ISTs discussed making adaptations to Pinterest resources and ideas (Figure 5). Of the 33 responses to this question, only two indicated they did not make adaptations to what they have found on Pinterest and that they use the materials "as presented." Five individuals indicated they "do not use Pinterest for lesson planning" because the content seems "primarily useful for elementary age groups." However,

were Pinterest to be used for planning, these teachers recognized the need for adaptations. One teacher shared, “I don’t use Pinterest for lesson planning. But, if I did, I would make adaptations such as simplifying directions and removing unnecessary text and images.”

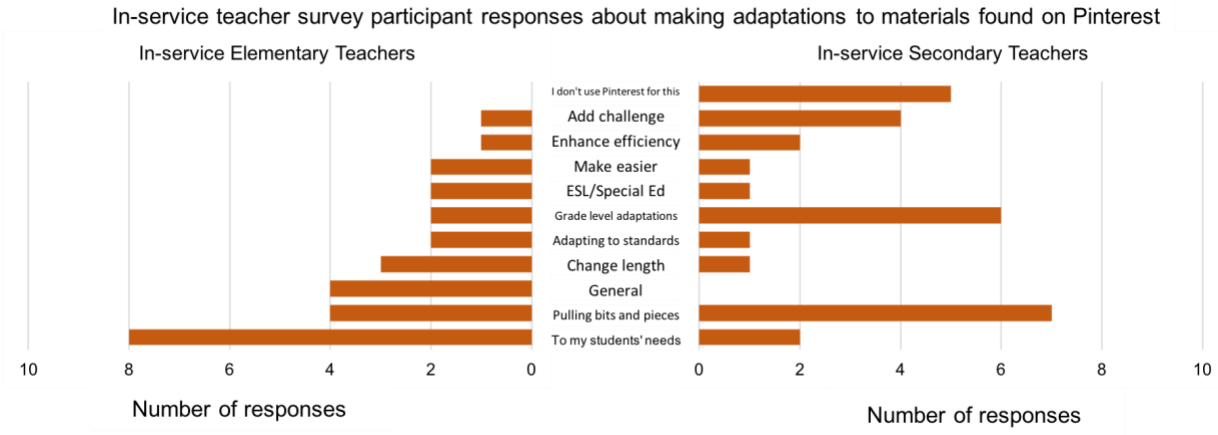

Figure 5. In-service teachers’ adaptations when using Pinterest

Overwhelmingly, secondary ISTs communicated the need to adapt resources to meet the needs of upper grade levels and their specific course content. Teachers noted that because materials found on Pinterest were typically for lower grades, they needed adjustments. As one civics teacher stated, “I almost always make adaptations. I’ve found that the civics lessons are typically too elementary or not built for high school level students.” Rather than taking ideas and resources as presented, secondary teachers make adaptations to add challenge (n = 4), attend to grade level and course standards (n = 6), enhance efficiency and length of lesson (n = 3), and meet student needs (e.g. for special education students) (n = 3). When secondary teachers *did* mention simplifying Pinterest resources, it was in order to make language more accessible for students who spoke English as a second language.

Secondary teachers also found lesson ideas on Pinterest to use as launching points to meet grade level standards, course curriculum, and student needs. Seven secondary teachers specifically shared that they frequently take individual components from Pinterest pins and then

adapt them to meet the needs of their grade level, course, or students. These adaptations are aimed at instructional goals such as creating class discussions, adjusting graphic organizers to meet targeted objectives, and adding grade-level appropriate higher order questions. These particular secondary teachers did not extract the complete idea from the Pinterest pin, they simply pulled bits and pieces and adapt ideas to meet their instructional needs.

One distinct difference between the elementary and secondary ISTs is the manner in which elementary teachers discussed making adaptations to meet student needs. Elementary teachers made adaptations focused specifically on differentiating for individual students and tended to address adjusting ideas to simplify content. Conversely, the secondary teachers' adaptations focused more on the overarching needs within their specific courses and the need to add challenging components to their adapted Pinterest resources.

How Teachers Determine the Quality of Pinterest Resources

Elementary Level Pre-Service and Elementary Level In-Service Teachers

As noted in our literature review, educational-related resources are the second-most searched for content on Pinterest, and there is a common concern across literature about the quality of these resources. Therefore, we deemed it essential to survey our participants about determining a pin's quality. We found that the majority of the elementary PSTs and ISTs had a process for determining the quality of Pinterest resources, some of which included multiple steps (Figure 6). Of the 77 elementary participants, only three individuals (one PST and two ISTs) stated that they did not worry about the quality of a Pinterest resource.

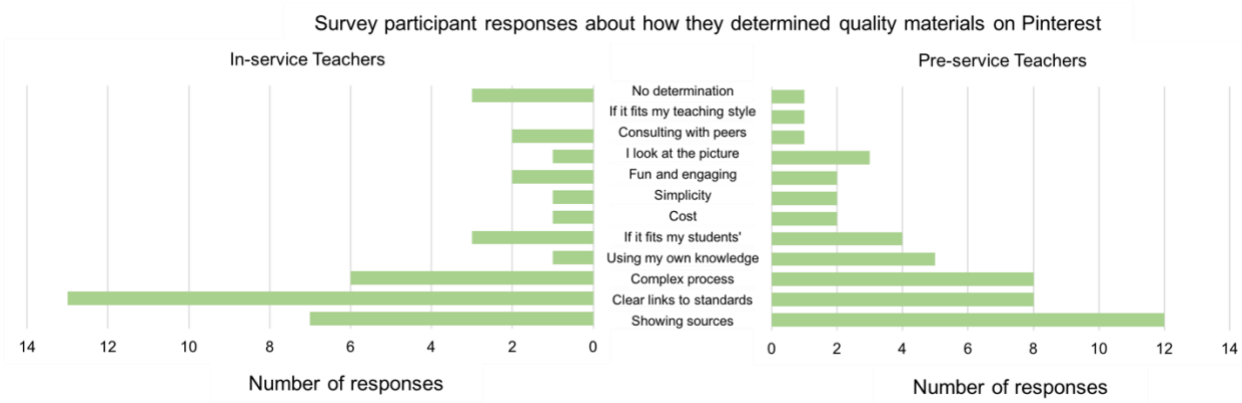

Figure 6. In-service and pre-service teachers' responses concerning how they determined quality of Pinterest resources.

For some elementary PSTs and ISTs, the criteria for determining quality consisted of looking at the pictures (n = 4), identifying potential monetary costs involved in using the resource (n = 3), the simplicity of the item (n = 3), and noting if the activity is "fun" or "engaging" (n = 4). However, 61 of the elementary PSTs and ISTs clearly identified predetermined criteria for quality that connected to their professional knowledge of standards, content, and student needs. Additionally, when describing their determination of quality, several participants articulated a complex multi-step process.

For 13 ISTs and 8 PSTs, identifying a clear link to standards was an essential factor for determining quality. These participants explicitly wondered, "Does it [the resource] align to the standards I am teaching?" Participants noted that Pinterest ideas "must align" with and "match" state and grade-level standards to be deemed as quality and often looked to see if the "idea or activity addresses the standards" and "if the language and nature of the activity is similar to how the state standards read."

In addition to looking for a clear link to standards, several teachers (n = 19) discussed "following the lesson or activity to the source where it was pinned from." Both PSTs and ISTs indicated that to determine quality they navigated to the creator's blog to "read and review the

creator's blog to get a clear idea of their philosophies." Participants then read about the teacher's implementation of the lesson. One PST explained, "I typically determine the 'quality' of the pin by directly linking to the source and researching where it originated from, such as the grade level and standards that it targets."

For some, the determination of quality was not about a single indicator such as standards alignment or meeting student needs. In 14 instances participants articulated a multi-step process that included various criteria for quality. In these situations, teachers communicated a deliberate process that triangulated multiple criteria for quality. Participants explained how they begin their search with the standard in mind, or as one in-service teacher stated, "I have a clear vision of what I need to search for." Then, using their professional knowledge, teachers scanned for items that appeared to align with standards, contained accurate content, and met the needs of their students. Almost all of these participants discussed connecting to "the teacher's blog or website that it [the resource] is linked to" to engage in more research as a portion of their multi-step process. At this point, participants had varied criteria they applied to their review of the creator's blog. These criteria included items such as quality graphics, content, clear examples, opportunities for student engagement, creativity, differentiation, and overall alignment to classroom needs. In two instances, PSTs described extended steps that included additional searches to cross-reference the data they discovered on the blog. One PST shared that in addition to clicking on the provided link, she conducts a "reverse image search" to see the adaptations other teachers may have made and to further identify if the lesson is suitable for her needs.

The main difference between the elementary PSTs and ISTs is the sophistication in which PSTs present their process for determining quality. Whereas the ISTs could more clearly communicate their adaptations to Pinterest resources, the PSTs could clearly articulate their

process and criteria for determining quality. PSTs provided explicit examples of how they searched for pins and noted that they connected back to the theory and coursework of their teacher preparation program. Also, PSTs identified differences between just searching for "inspiration" versus strategically planning for a lesson. One PST shared this distinction:

> If I am just looking for inspiration I will pin almost anything that might spark an idea in me to base a lesson loosely off of what I saw. If I am really going to use the exact thing I saw I go to the teacher's blog and check them out. I usually look at the graphics used, look if they are clear, and I look at the content to decide if it is appropriate for my students.

Overall, despite the many similarities in how elementary teachers determined quality resources on Pinterest, elementary PSTs shared a more sophisticated and complex method for doing so.

Elementary Level and Secondary Level In-Service Teachers

The secondary ISTs somewhat mirrored the elementary ISTs in that only one participating secondary teacher explicitly stated they "do not determine [the] quality" of pinned Pinterest resources (Figure 7). To determine quality, some secondary teachers relied on criteria focused on the simplicity of the resource (n = 3) and pictures within the pin (n = 2). Additionally, two secondary teachers focused on resources they could adapt easily to their teaching style or were perceived to be fun and engaging. However, the majority of the secondary teacher responses indicated they had a set of predetermined criteria they used to judge the quality of a Pinterest resource, mostly connected to their professional knowledge of content and student needs.

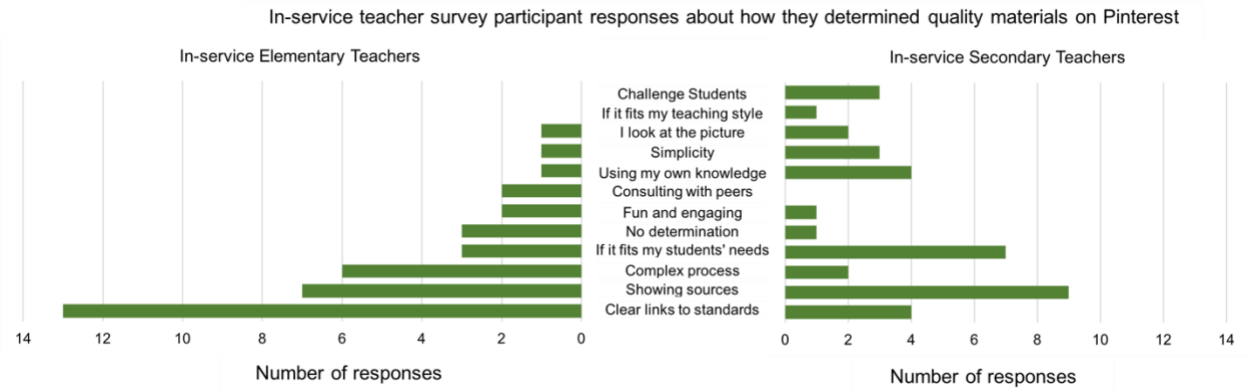

Figure 7. In-service teachers' determinations of quality resources on Pinterest

For example, ten secondary teachers applied criteria to judge the quality of a pin focused on challenging and meeting student needs. When determining if a resource is "challenging enough" three teachers focused on the pin's potential "level of impact on learning" and how it may "seamlessly connect" to content. One secondary teacher indicated she seeks to identify "if it [the resource] is something that has depth and requires my kids to move past the surface level of what we are studying." Seven secondary teachers indicated criteria focused on "analyzing its [the resource] effectiveness and validity for my class." These teachers determined quality based on the specific needs of their students and consistently wanted to know if the resource was appropriate for their "student audience" or if the resource could be "adapted to my students."

In addition to determining a Pinterest resource's ability to challenge and meet student needs, several secondary teachers (n = 9) also determined quality by connecting back to the source of the pin. Similarly to the elementary teachers, these individuals "clicked through" to read the source, which may have been an individual teacher's blog or a Teachers Pay Teachers site. When reviewing the source, these teachers sought to identify if the pin had additional resources, comments to access, and if it "has been created by someone who looks authentically involved in education."

Whereas the majority of secondary ISTs indicated predetermined criteria for determining quality, there were some distinct differences between the elementary and secondary teachers'

determination of a quality Pinterest resource. First, the elementary teachers focused more on determining a resource's clear alignment to standards. While four secondary teachers did specifically discuss standards alignment, secondary teachers appeared to rely more on determining the adaptability of a Pinterest pin to meet their students' needs. Additionally, we noted a difference in the level of sophistication exhibited in determining quality. When determining quality only two secondary teachers explained a multi-step process for vetting the pinned resources, as opposed to the six elementary ISTs who identified such a process. It is important to note that elementary PSTs overall expressed a more nuanced process of determining quality on Pinterest than any other group.

Discussion and Implications

This study sought to understand how teachers engage with the widely-used social networking site Pinterest. Our overarching findings suggest that teachers across all levels use Pinterest for largely the same purposes: to gather and collect ideas, find specific instructional tools, and seek out content-specific materials. However, an important difference between ISTs and PSTs we uncovered was the need to find "cute and fun" materials, as only one IST indicated looking for such materials. This may be explained by the tenuous position emerging teachers hold in the classroom. Provided with limited responsibilities as guests in mentor teachers' classrooms, PSTs may have more time to make use of cute and fun materials than ISTs seeking to meet the demands of high-stakes testing or curriculum requirements. This finding runs counter to the literature base on Pinterest, as many scholars note their concern that teachers overly rely on Pinterest for such materials (Miller, 2015). Another notable difference in the purposes for using Pinterest existed between elementary and secondary teachers. Unlike elementary teachers who repeatedly mentioned looking for resources such as foldables and anchor charts, secondary

teachers shared that they sought out a wide array of resources related to their content areas, such as artwork, French news articles, or discussion questions related to novels.

As our theoretical framework suggests, by using a site such as Pinterest, PSTs and ISTs implicitly acknowledge that knowledge is distributed outside of the individual and can be contained within "non-human appliances" (Siemens, 2005, n.p.). Teachers' use of the site is a tacit acknowledgement that the site contains within it legitimate sources of information, particularly around hands-on, engaging activities. The differences in how secondary and elementary teachers use Pinterest reflects the notion that information technologies can both limit and expand what is available to learners (Dunaway, 2011). This is evidenced by the fact that secondary teachers' needs appear quite different than elementary as they tended to scale up the difficulty of content and adapted some parts of activities. Many secondary teachers shared the assumption that Pinterest was a site for sharing elementary level resources which led them to find resource support on other social media sites (i.e. Facebook groups).

This research also uncovered that teachers were savvy in their methods for determining if Pinterest resources were of high quality. Decision making is a key feature of connectivist theory (Siemens, 2005), and our participants indicated that using Pinterest required this skill. Many participants made a number of decisions, some quite complex, as to whether to use a resource or not. They returned to the source it was pinned from, connected to standards, thought about their students' needs, and used their own knowledge of pedagogy and content to ultimately make decisions regarding what to use. Some teachers were concerned with the "authenticity" of materials, a term they interpreted as meaning that a resource had been used or developed by other practicing teachers. More PSTs than ISTs described a complex, step-by-step method of determining if something was of quality. We speculate that this difference could be due to PSTs

having less professional expertise and experience to rely on, thus requiring a complex process of checking sources and standards. Furthermore, PSTs may also have had training in examining freely available Internet resources in their teacher education programs and/or more immediate training in methods coursework that perhaps gave them a more critical eye. Indeed, connectivism reminds us that the notion of networked knowledge is relatively new, arising with the advent of the Internet (Siemens, 2005). PSTs' connection to the college classroom may better facilitate their skepticism about sources than ISTs who have been in the field (and out of the college classroom) for longer. More research would be required to confirm this speculation.

Overall, these findings suggest that some of the fears expressed in scholarship regarding teachers making use of the poor quality resources available through Pinterest or the danger of a Pinterest curriculum may be uncalled for, as teachers in this study reveal that they largely use Pinterest to find engaging activities rather than to plan entire units or lessons, adapt what they find to meet the standards and their students' needs, and identify criteria to assess quality. While we are unable to make the claim that teachers do not use some of these poor-quality resources, we *are* able to suggest that the teachers in this study claim to be thoughtful in their choices. We are concerned, however, that very few teachers indicated adapting resources from Pinterest to meet the needs of culturally and linguistically diverse learners specifically, leading us to believe that additional research is necessary to explore how teachers use Pinterest to meet the needs of all learners. Interviews, observation, and document collection in these studies would be particularly beneficial so that researchers might probe to clarify meaning or explore teachers' processes for determining quality resources more in depth.

Based on the somewhat surprising finding that PSTs are being savvy in their selection of resources, research into how teacher educators are preparing future teachers for this new reality

is warranted. Knowledge of the processes these teacher educators are using may in turn assist others to "help the next generation of educators learn how to take advantage of the learning affordances and also address the complications of social media such as Pinterest" (Carpenter et al., 2018, p. 2227). Perhaps we may learn from the teacher educators instructing the PSTs in this study in particular as to how they are doing this work.

Another approach may be adapting models of media literacy meant for elementary and secondary students into a step-by-step model that, coupled with their own professional expertise, helps teachers filter "cute" from "quality" on Pinterest. Gallagher, Swalwell, and Bellows (2018) are piloting one such model in the field of social studies using flowcharts with teacher candidates to encourage "safe pinteresting" from a social justice perspective. Examining in more detail the complex steps PSTs make in determining quality of resources could also prove fruitful in developing a step-by-step model able to be more generally applied beyond the social studies field. Indeed, future research could explore teacher thought processes while determining quality, including having teachers walk researchers through the process of finding a resource and determining its quality. Analyzing lesson plans and lessons in action that have incorporated ideas sparked by Pinterest resources could also provide insight into the effective adaptations teachers make to found resources. Beyond Pinterest, we see a need for the development of a social media mindfulness (Damico & Krutka, 2018; Levy, 2016) as well as a social media pedagogy (Krutka, Nowell, & Whitlock, 2017) in teacher education and in-service professional development. The broader topic of digital literacy, including the foundational knowledge and skills for interfacing with various applications, is an important component of the teacher education curriculum. Within this broad topic, individual platforms including Pinterest, Twitter, Facebook, and Instagram, should be incorporated into teacher preparation curricula.

Pinterest and other social media sites have allowed for the free exchange of ideas and resources adding multiple nodes in the learning network (Dunaway, 2011). Pinterest expands the information available to learners and thus serves as a significant influence on their practice. Expertise, advice, and lesson plan inspiration come from a variety of sources, including the "second faculty lounge" teachers find online via social media (Carpenter & Morrison, 2018). Teacher educators, then, must adapt to changing times as information technologies expand access to learning materials. To adapt requires that teacher educators and others who work closely with teachers first understand how teachers are navigating these digital spaces. This study has been one step in that direction.

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