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Induction Support for New Teachers: A Blog as a Tool for Professional Development

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Abstract: The purpose of this research was two-fold. First, while the use of Web 2.0 tools in education has increased, there has been limited research in how teachers (and teacher educators) are using these tools for their own professional development. This article describes one tool used to support beginning teachers. Secondly, this study was designed to survey the readers of a blog of which the researcher is primary author. As author of the blog for six years, it is important to make sure that the content of the blog is as relevant to new teachers as possible. The survey results contribute not only to the research on blogging as a tool for professional development, but help the researcher craft future posts on the blog as suggested by participants.

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INTRODUCTION

Recent research indicates that an effective teacher is the single most important school-related factor in student outcomes (Darling-Hammond, 2006; Moir, Barlin, Gless, & Miles, 2009; Pesky & Haycock, 2007). Unfortunately, many beginning teachers leave the classroom within their early years of teaching. That teaching has a high attrition rate is not surprising; this has been shown over time (Lortie, 1975; Tyack, 1974) and teacher turnover continues to remain high (Ingersoll, Merrill, & Stuckey, 2014). Findings from the most current teacher and former teacher data files of the 2012–13 Teacher Follow-up Survey (TFS), a nationally representative sample survey of public and private school K–12 teachers who participated in the previous year's Schools and Staffing Survey (SASS), indicate that 7.7% of the teachers surveyed left the profession in 2013, with higher rates among teachers in the first three years of teaching (7.1%) than those with 4-9 years (6.8%) or those with 10-19 years (5.9%) (Goldring, Taie, & Riddles, 2014). Ingersoll, Merrill, and Stuckey (2014) indicate that the attrition of beginning teachers is rising and is disproportionate in schools serving poor and minority students. Teachers leave the field far in advance of retirement, causing a constant influx of new teachers into schools (Ingersoll & May, 2011), particularly those that teach poor and minority students.

Attracting and retaining new (effective) teachers, particularly those serving in poor and minority schools, has never been more important. This begins with high-quality preparation, but needs to continue through ongoing induction support, which has been shown to reduce teacher attrition by helping teachers feel more prepared (Ingersoll & Smith, 2004; Ingersoll & Strong,

2011; Moir 2003). Development of and beginning teacher participation in induction programs has steadily grown over the last decade, with as many as 80% of first-year teachers participating in some kind of induction program (Ingersoll & Strong, 2011), though the content and quality of induction programs vary widely (Ingersoll & Smith, 2004, Goldrick, 2016).

Traditionally, support for beginning teachers has been the responsibility of the school and district that hires a new graduate of a teacher education program. According to Clandinin and Connelly (1986), "practical knowledge is gained through experience with the cyclic nature of schooling and classroom life. The experience is known in terms of a narrative which is reconstructed on the basis of additional experience" (p. 380). Feiman-Nemser (2001) also posits that teachers must know many things, and while some knowledge is best gained through university coursework, other aspects of teaching must be learned in the context of practice. Teacher learning and development occurs on a professional learning continuum, initiated during the teacher preparation program and extending throughout teachers' careers. Therefore, professional development beyond the preparation phase is necessary to provide continued support for the growth of teachers. Induction programs serve multiple objectives, among them being teacher socialization, adjustment, development, and assessment (Feiman-Nemser, 2001; Ganser, 2002; Ingersoll & Strong, 2011).

Because of increased accountability of teachers and the need to show effectiveness in student learning, there has been a call for teacher education programs to be accountable to and help provide induction support for their graduates (Feiman-Nemser, 2001). This presents a great challenge to teacher education programs, as graduates take jobs in many districts across many states, making on-campus professional development opportunities geared towards graduates challenging at best.

Blogs have been shown to be a transformational tool for teaching and learning (Williams & Jacobs, 2004) and have been used for a variety of purposes in teacher education, including as a means of providing peer support and peer learning (Hall & Davison, 2007). With Web 2.0 technologies, support for teaching and learning can become an ongoing dialogue from a distance. Blogs allow for the interaction of readers and authors, in that readers can comment on and link to the content of blogs (Brandon, 2003), and because blogs are not geographically or temporally constrained (Luehmann & Tinelli, 2008), they can be accessed wherever is best for readers. The majority of research conducted on blogs in teaching focus on student blogging (Albaugh, 2013; Angelaina & Jimoyiannis, 2012; Hani, 2015; Jerles, 2012; Lacina & Griffith, 2013; McGrail & Davis, 2011; Meinecke, Smith, & Lehmann-Willenbrock, 2013; Mitchell, 2013; Sawmiller, 2010), or teacher-created blogs (Chen, C., Lai, H., & Ho, C., 2015; Coiwell, Hutchinson, & Reinking, 2012; Hou, Chang, & Sung, 2009; Luehmann, 2008; Makri & Kynigos, 2007). However, this blog was constructed with the intention of being a professional development resource for teachers and an agent for interaction among teachers.

NEW TEACHER TALK BLOG

The institution in which I teach is a part of a collaborative of institutions working together under a grant designed to improve the quality of teacher education. As part of the grant, the work of institutions was designed to address four key pillars: recruitment, preparation, employment, and support. In order to help address the pillar of supporting graduates as new teachers, an initiative for a blog was developed as a way to connect with graduates of the collaborative institutions' teacher preparation programs and provide them with a measure of support as they begin teaching. As part of the grant, I was invited to imagine what a blog providing induction support for our teacher graduates might look like was tasked with beginning the project.

It began as a one-year experiment; a blog would be created and maintained to provide one level of support for new teacher graduates. Beginning teachers' success can, in many ways, be accelerated or stymied by access to individual and collective support. Therefore, the blog would feature information relevant to beginning teachers, supported by research and local district interests. The blog, linked from each institution's education department website as well as the collaborative's website, would also feature a linked twitter account that would increase accessibility to the postings and encourage readers to participate with questions and comments linked to blog content. In addition, readers would have the possibility of connecting with one another. And thus, an induction blog began to take shape.

The blog New Teacher Talk: Learning to Think Like a Teacher, http://newteachertalkonline.blogspot.com/, is designed be a forum supporting beginning teachers. Because it can be accessed anywhere, it is intended to help new teachers feel support linking back to their preparation programs no matter where they end up teaching. While my primary responsibilities at

the Midwestern University in which I teach include teaching literacy methods courses, graduate assessment and research methods courses, and student teaching supervision, I also author the blog New Teacher Talk and post 2-4 times per month. In this manuscript, I aim to share background in the development of the blog, results from a small-scale study related to the readers of the blog, and lessons learned as the author of an induction blog for the past six years.

The blog is designed to augment practice-based professional development (Dillon, O'Brien, Sato, & Kelly, 2010), as it is acknowledged that stand-alone professional development opportunities are less effective for beginning teachers (Moir et al., 2009). The blog was initially designed to provide support throughout the school year based on the work of Moir (1990) on the phases of new teachers. Therefore, throughout the year, posts are written to help beginning teachers reflect on their current phase: anticipation, survival, disillusionment, rejuvenation, reflection, and back to anticipation. Blog posts share background on these phases (though acknowledging that progression through these phases is not linear and not guaranteed) and provide suggested support for teachers at different phases within the year. For example, a January 2013 post focused on the disillusionment period for new teachers:

> I have always felt that the new year begins in August. January feels like an odd time for teachers to celebrate a new year, since our year begins in late August and ends in June. But the official, internationally recognized New Year can also provide a time of reflection, rejuvenation, and renewal for teachers also.
>
> However, the darkness of winter and the fact that the school year is not even half over can lead new teachers to experience a phase of disillusionment. This phase typically hits new teachers (and experienced teachers too!) sometime in the middle of the school year and can last for quite a while. Stress is a major factor in leading new teachers to feel disillusioned. Sickness, which seems to be going around big time this year, can make a stressful job more stressful. You're run down if you can get to school, and planning for a sub if you can't is always more work than being in school to begin with. And sickness might have hit you over break, too, which might have made you feel tired and unrefreshed when you headed back to school this week. The learning needs of your students feel urgent, especially in the spring testing season staring you down, but classroom management issues might be getting in the way of accomplishing what you want to academically with your students. Observations and evaluations by an administrator or instructional coaches, which add a lot of stress to an already stressful job, can lead new teachers to feel uncertain in their competence as a teacher. The reality of the commitment to teaching is finally clear, and during the disillusionment phase teachers might question their decision to become a teacher.
>
> But know this - this is a common phase of teaching and you are surrounded by others that are experiencing this too. It might not help to know that others feel this way, but it might help you know you aren't crazy or alone. Even after years and years of teaching, I still experience this feeling, sometimes for only a few days or weeks, and sometimes for longer. This phase (like all things) does pass, but it can help the time pass more quickly if you seek out or reach out to a supportive network of other teachers with whom you can talk about these feelings. Maybe this is the time to contact a teacher you went through your preservice program with that you have been meaning to communicate with but just haven't made the time. Or find the other new teachers in your building and/or district and suggest a happy hour to talk things through. Other supportive folks, like family and friends, can definitely help too, but sometimes you just need to talk to another teacher that might be feeling the same way. This feeling of disillusionment can be a very difficult challenge to get through in your first years of teaching, but talking with others can help.

In a follow-up post later that month, three ideas were suggested for staying sharp and focused through the disillusionment phase: finding a mentor; simplifying routines, management strategies, and schedules; and to be mindful of and recognize all progress, however small. The posts on disillusionment, a fixture of every year I've authored the blog, tend to be among them most read and shared posts. A comment from a teacher candidate reader posted on a disillusionment post included:

> So glad you wrote about this. I was just thinking this past week about how hard it is going to be to maintain some confidence during my first year.

> I got some amazing letters of recommendation that made me feel really good. But, now I am thinking, what if I don't live up to what people wrote about me? What if my first job colleagues hate me? Ugh…It is so nice to read your reassuring words and know that I can return and look at them when I am in this phase of teaching! Thanks!

These phases impact teachers in different ways and at different points throughout the year, but since every published blog post is available at all times, teachers can access (and return to) posts whenever they are most applicable to them and their development.

In addition to a focus on the phases of beginning teachers, the blog has a series of posts focused on the job search process to help teachers secure a job. Resume and cover letter tips, as well as guidance in preparing for job interviews are included. In addition, posts are designed to provide resources for common challenging aspects to teaching, such as just getting started in a new school. One post, "Learning the ropes: ask, ask, ask" started in the following way:

> Yesterday I met with two teachers who will be teaching new curriculum in their 7th grade class, and I asked them the question I've been asking all the teachers I run into lately, "What advice would you give first year teachers?" They had a great response - don't assume you should know everything. What they meant by that was that it is natural to want to portray yourself as "in the know," to have everything under control. But they each said they spent far too much time their first year of teaching trying to figure things out on their own that would have been much easier if they had just asked someone.

As well as general advice about getting started in a new school, posts focus on working on a team, participating in mentoring programs, being evaluated and information on common professional organizations. Other common topics that focus more on classroom practice include classroom management strategies, culturally responsive pedagogy, differentiation, using data to inform instruction, effective strategies for teaching ELLs, reviews of books/materials, reflecting on teaching and learning, support for teaching the Common Core State Standards, technology resources, and preparing effectively for a substitute. I reach out to content-specialists when I receive comments or emails requesting subject-specific strategies, and occasionally, a guest blogger from other institutions have provided posts based on their area of expertise. At times, current events that children are hearing and thinking about such as presidential elections, the death of Trayvon Martin, the school shooting at Sandy Hook, or the unrest in Ferguson, MO become blog posts designed to help teachers effectively plan lessons around these topics. Posts include practical ideas, buttressed by supporting research, and often include stories of my own practice or the practice of teachers I know and work with. An example of this can be shown from a post titled, "Kidwatching":

> I was in an elementary classroom last week and in observing the teacher, I noted what a masterful kidwatcher he was. Kidwatching (Owocki & Goodman, 2002) has several key components: (1) it involves noticing and taking note of what students know and can do, (2), it is the attempt to understand students' ways of constructing and expressing knowledge, and (3), it is the use of this data to inform instruction and assessment. We all know that students can be more or less successful in certain contexts, and understanding these contexts can help teachers plan for the most effective instruction for students.

This bridge between theory and practice hopes to serve beginning teachers critically reflect on concepts introduced in their preparation and linked to their own teaching experience.

To help me decide what to write about each week, I listen carefully to the P-12 students, teacher candidates, and teachers working in the schools where I supervise student teachers or field practical. In addition, I listen to the teachers I work with through professional development experiences and in my position on the executive board of several education professional organizations. As well, I draw on my recollections from my 10 years teaching elementary and middle school and 5 years as a district literacy specialist, as a district literacy consultant, and currently as an occasional substitute in the local district where I live. As a faculty liaison in a partner school, I have spent significant time in one particular elementary school supervising field experiences, student teachers, and providing professional development. This depth of experience affords me opportunities to learn more specifically what the real-time concerns of teachers in our local schools, and to check these against state and national trends in schools and teaching. While the blog is situated with a focus on schools and teachers due to my geographical location, I do try to write broadly about concerns and examples to be more applicable to a range of readers.

Since it began, the blog typically gets approximately 50 hits a day. An average post will typically receive around 200 hits in its first month on the blog, with an average number of 2,000 hits to the site across posts per month. Some of the posts with the largest number of views are those focused on the job search (for example, a post including an example of a teaching cover letter has been viewed over 20,000 times), yearly posts written with new first-day of school read-aloud suggestions (over 4100 views across the 5 posts to date), and a post on removing sarcasm as a teaching strategy (over 2500 views). Most readers come to the blog through Google searches of teaching related topics, as well as links from the collaborative's website, institution websites, and associated Facebook pages. Though the audience tends to access the site mostly from within the United States, international readers have also accessed the site.

STUDY

As part of my work on the blog, I developed a survey [Appendix A] to research the blog's readers and interests. The purpose of this survey research was two-fold. First, while the use of Web 2.0 tools in education has increased, there has been relatively limited research in how teachers (and teacher educators) are using these tools for their own professional development. This study was designed to survey the readers of New Teacher Talk about their reasons for accessing the blog. Secondly, as the author of the blog for over four years, it is important to make sure that the content of the blog is as relevant to beginning teachers as possible. The survey results, therefore, contribute not only to the research on blogging as a tool for professional development, but help craft future posts on the blog as suggested by participants. Research questions guiding this study included:

1. Who are the readers of New Teacher Talk (i.e. teacher candidates, in-service teachers, teacher educators, administrators, parents)?

2. What are the reasons that people visit the blog?

3. What topics and issues do visitors to the blog learn from the most?

4. What topics/issues/concerns would visitors like to have explored on the blog?

5. What other types of social networking or Web 2.0 tools are visitors using and/or would be interested in connecting through for PD?

The data for this study was collected using an online survey using Qualtrics. The survey included both forced choice as well as open-ended questions. The survey was linked at the end of each post from April 2014 – January 2015. Analysis strategies included reading and rereading of the open-ended responses on the survey, the writing of theoretical memos (Glaser, 1978), and inductive and deductive coding (Miles & Huberman, 1994). Initial open coding with the responses was done line-by-line and then question-by-question allowing for detailed and generative coding (Strauss & Corbin, 1990). Analysis then moved between open and axial coding in order to make new categories, and verify proposed assertions and relationships within cases (Erickson, 1986). The categories included: web resources used for professional development, needs of new teachers, reasons for reading, and ways to support new teachers. In addition, descriptive statistics were generated for the responses on the survey. Due to the nature of the survey, linked at the bottom of each new post from April 2014 – January 2015, it is not possible to calculate a response rate since numbers of those who saw the survey on the blog can only be estimated. Though the number of participants ended up being small (n=12), responses shape the blog for future posts and for the use of this tool for new teachers.

Analysis of the survey revealed that 100 percent of survey respondent readers for the New Teacher Talk blog were practicing P-12 teachers. When readers were asked what drew them to access the blog, it was most often because of a positive recommendation from a college instructor or teacher colleague (58%). Readers also indicated that they found posts through Google searches (25%) or links from other sites (17%) which would include the teacher education collaborative's website. One teacher indicated, "I'm a new kinder teacher looking to connect with other new teachers and mentor teachers as well!!" In addition to the New Teacher Talk blog, the additional primary Web 2.0 tools used by the readers included Facebook, Instagram, and Pinterest. Additional resources teachers accessed for professional development included in-school/district opportunities, web-based resources, and reading professional journals (both traditional and online).

In addition to the details of who the readers are and what drew them to New Teacher Talk, the survey asked what topics were of particular interest to readers. Readers of the blog indicated that additional focus on classroom management is desired. Classroom management challenges are one of the main reasons new teachers leave the field (Latham & Voyt, 2007), so this was not a surprising request. Similarly, one reader indicated an interest in learning more about, "teaching students

from trauma backgrounds, abuse, treatment programs or with mental health issues. My students are lacking in motivation and self-esteem and I want to be able to choose literature and topics that don't trigger them but help them become more engaged in school." In addition to classroom management and mental health concerns, a reader indicated an interest in support in learning about "professional duties." The reader wrote, "classroom management and 'professional duties' – this doesn't get covered much in teacher prep courses and I have found it the biggest reality check of having a real teaching job." While unclear to what specifically the teacher is referring to as "professional duties," there is certainly no lack of responsibilities of a teacher within and beyond the classroom walls. Indeed, beginning teachers' responsibilities do not vary significantly from experienced teachers (Fantilli & McDougall, 2009). Beginning teachers need to deepen understanding not only what it means to be a teacher, but also how to be an effective employee, colleague, teammate, committee member, and advocate. This emphasis on adjustment (Griffin, 1987) historically has been an aspect of induction, to help new teachers understand school communities in which they are teaching.

Readers also requested support for navigating the balance between district requirements and "best practices." One teacher, in response to what might make New Teacher Talk more relevant and useful indicated, "just came across your website, so not sure yet, but anything a beginning teacher would have concerns about, example how to survive the first year, best practices, where to find support." Readers of the blog also asked for reviews of technology and book resources, both to use to support their own organization and teaching, as well as those that students could use in their learning. To end the survey, when asked for any additional information for the author of New Teacher Talk, one reader wrote, "Thank you for writing. It helps me feel connected and less alone in the profession." Feeling connected to other professionals is a key goal of induction support for new teachers (Allen, 2009). This feedback helps guide the future of the blog, and supports the need for varied, accessible support for beginning teachers.

LESSONS LEARNED

New teachers need to learn many things. And, as Feiman-Nemser (2003) states, "keeping new teachers in teaching is not the same as helping them become good teachers" (p. 25). Many studies and reports have outlined features of successful induction programs (Carver & Feiman-Nemser, 2009; Gilles, Davis, & McGlamery, 2009; Goldrick, Osta, Barlin, & Burn, 2012; Ingersoll & Strong; 2011; Moir, 2003; Teacher Support Partnership, 2009). With that, the effort of the blog does not assume to be the simple method for quality induction. However, while small in scale, the study indicates that reaching teachers through a variety of professional development avenues can be helpful for teachers. With time being at a premium, professional development needs to support teachers when and where they have access. While this study does not propose the use of Web 2.0 tools, particularly a blog, to be the primary venue for induction support for beginning teachers, a blog can be used to reach teacher graduates flung far and wide across the world looking for connections to ideas they learned about in their preparation phase of teacher development. All that said, there are other significant challenges and limitations of the blog. My expertise in literacy development and teaching undoubtedly provides a frame for my writing and privileges literacy-related topics on the blog. Teachers, on the other hand, need content-specific strategies and mentoring from experts in their field (Luft, Neakrase, Adams, Firestone, & Bang, 2010; Wood, Jilk, & Paine, 2012), as studies suggest that teachers are less likely to leave the profession or their school if their mentor teaches in the same discipline (Smith & Ingersoll, 2004). Though there are occasional guest bloggers for New Teacher Talk, I have been the author of the vast majority of the posts. Finding ways to continue to support effective content-specific knowledge and pedagogy would strengthen the effectiveness of the blog.

One of the initial objectives for the blog was to be an agent for interaction with and between beginning teachers. Online networks have been shown to help support beginning teachers (Killeavy & Molloney, 2009; Zuidema, 2012). However, this aspect of the blog has not happened significantly. One possible reason for this is that though commenting on the blog can be done anonymously, it might be difficult for new teachers to acknowledge areas of weakness in a perceived public way. Beginning teachers developing self-efficacy in teaching may be reluctant to publish their worries and concerns, however anonymous the comments might be. Though comments do occur on blog posts, the comments are few considering the level of readership. Another reason for the lack of engagement through comments is that a blog is not necessarily the best forum for discussion. Though threaded comments can foster a continued discussion on a topic, and has on other blogs, this has not occurred with the New Teacher Talk blog. Finding ways to encourage interaction is a continued goal for this work in order to provide networks and connections that new teachers need (Allen, 2009).

These limitations are significant. A blog cannot provide the main source of induction support for new teachers, nor was it ever intended to be such. Indeed, the most powerful professional development experiences I have had have been situated in my immediate, personal teaching contexts, and a blog certainly cannot provide this level of support. Nevertheless, readers returning to the blog for advice, reflection, and connection indicate a value in the medium. Across five years of writing and through the results on the survey, there are ways for this blog, or similar efforts, to advance the work of induction support for beginning teachers. Generally, there are promising results in using online social networks such as blogs as an avenue for professional growth in teachers. As well, spaces that listen to and address what beginning teachers say they need provide a valuable medium for new teacher development. Specifically as it relates to New Teacher Talk, perennial topics of classroom management, mental health of students, and content-specific strategies were identified as those the readers were interested in reading more about and will be a focus for future posts making the content more relevant to the readers of the blog. In addition, in order to help the new Kindergarten teacher reader mentioned above who is looking to connect with other new and mentor teachers, creating space for interaction on the blog, currently unrealized, remains a goal for the blog.

In addition to the support the blog may provide for new teachers, it has shaped my own teaching practice in unexpected ways. As I listen intently to teachers in the field, gathering ideas for future posts, I am continually thinking about how I can support the teacher candidates in my courses and field experiences to think and learn more about, feel more confident in, and gain effectively experience in the areas that arise from my encounters with practicing teachers. The blog provides a venue for deeper critical reflection on these topics, bridging my own understanding of theory and practice, and is cross-checked against what I observe in schools and classrooms, and my experiences when I serve as a P-12 substitute teacher. Conversations I begin in a school, continue in my courses, and guide my reading of research eventually become blog posts. The opportunity to serve as the author on this blog has caused me to refresh or expand my knowledge in aspects of teaching I may not regularly encounter in my own practice. While there have been weeks I have struggled with the writing, a thoughtful reflection on my time in schools that week always provides inspiration.

Because a system of supports is most effective for beginning teachers (Ingersoll & Smith, 2004), this blog serves as one small support in new teacher development. This blog creates a connection, even a thin one, to a preparation institution, and can build bridges between theory and practice. Teacher graduates of the University and other teacher education collaborative institutions often teach in rural communities, far away from a breadth of professional development opportunities offered in urban settings. Providing this access to teachers, either at home or at school, can supplement the professional development of the school and district in topics of interest to the individual teacher. Though only one piece of an induction puzzle, as the author of this blog, I hope to continue to reach new readers in some small ways to support their development as beginning teachers.

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APPENDIX A - SURVEY

Describe your current position:

- ☐ College/university student
- ☐ P-12 teacher
- ☐ College/university professor
- ☐ P-12 administration
- ☐ Substitute teacher
- ☐ Working, non-education field
- ☐ Other:_____

How did you find New Teacher Talk?

- ☐ Flyer/postcard advertisement
- ☐ Recommendation from a college/ university professor
- ☐ Recommendation from a colleague
- ☐ Collaborative website
- ☐ Internet search
- ☐ Other: _____

How often have you accessed New Teacher Talk?

- ☐ This is my first visit
- ☐ Every few months
- ☐ Once a month
- ☐ 2-3 times a month
- ☐ Once a week
- ☐ Every time a new entry is posted

I currently subscribe via email or RSS feed to New Teacher Talk.

- ☐ Yes
- ☐ No

What lead you to read posts at New Teacher Talk?

_____
_____
_____

What topics are most helpful on New Teacher Talk?

_____
_____
_____

What topics would you be interested in reading more about in future New Teacher Talk blog posts?

_____
_____
_____
_____
_____

Where do you go for most of your professional development? Indicate the 3 ways you most frequently access professional development.

- ☐ In school/district workshops
- ☐ Out of school/district workshops
- ☐ Conferences
- ☐ Professional journals
- ☐ Talking with other educators
- ☐ Education websites
- ☐ Other: _____

Which social media and Web 2.0 tools do you access regularly?

- ☐ Facebook
- ☐ Twitter
- ☐ Diigo
- ☐ Pinterest
- ☐ Tumblr
- ☐ Blogs
  - ☐ Other:

What could the author of New Teacher Talk do to make it a more relevant and useful web resource for educators?

_____
_____
_____

Any additional information for the author of New Teacher Talk?

_____
_____
_____

Effective Integration of Wellness and Writing: A Firsthand Focus for Teacher Preparation Programs and Secondary Classrooms

Alicia C. Stapp
Mary Ann Parker

Abstract: The expectations placed on teachers in secondary classrooms continue to rise alongside the obesity epidemic in the United States. Obesity rates for adolescents, ages 12-19 saw a rise from 5% in 1980 to approximately 21% in 2012 (Ogden, Carroll, Kit, and Flegal, 2012). Obesity among adolescents in the United States and the focus on writing in state standards and state assessments give relevance to teaching wellness and writing in the secondary classroom. However, wellness and writing are often viewed as less important compared to other subjects in middle schools (Segal, 2012). Thus, less emphasis is placed on wellness and writing pedagogy. This article provides a firsthand focus for the necessity of wellness and writing by examining a pedagogical framework for teacher preparation programs that could increase effective writing instruction and improve overall adolescent wellness. An integrated unit is also provided for teacher preparation programs and secondary classrooms.

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Keywords: wellness, writing, pedagogy, teacher preparation, middle school, integration strategies

INTRODUCTION

Today's technologically savvy students have instant access and feedback to communication through ever multiplying venues. Facebook, Instagram, texting, and Twitter allow nonstop communication;however, these sites do not provide adolescents with the ability to participate in the traditional format of paper and pencil. Additionally, technology that twenty-first century students utilize to communicate has led to more sedentary behaviors (Toriano, et al., 2008).

Compounding the paradigm shift in communication is the lack of writing instruction found within teacher preparation programs and secondary classrooms. Without proper writing instruction and a focus on decreasing sedentary measures in the secondary classroom, adolescents may continue to lack proficient skills in traditional writing and the current increase of adolescent obesity may continue to rise.

BACKGROUND

Current State of Adolescent Wellness

It is recommended that children, ages 6-17, receive at least 60 minutes of physical activity daily, with the majority of it being moderate to vigorous aerobic activity (Center for Disease Control and Prevention [CDC], 2013). However, adolescents have been known to be one of the most sedentary groups (Rabin, 2015). Toriano et al.'s (2008) study indicated that only one in ten adolescents actually receive the 60 minutes of recommended physical activity each day. A recent study showed that 549 students between the ages of 12-16 were active at school for only 4.8% of the day, or approximately 23 minutes (Carlson et al., 2015). The CDC (2013) also noted that participation in physical activity declines as young people age. A decline in physical activity for adolescents can have long-term effects such as obesity. (Daniels, Arnett, and Eckel, 2005). Compounding the wellness shortcoming, studies

indicate that health-related factors in students directly relate to poor grades, test scores, and lower academic attainment (Carlson, et al., 2015) (MacLellan, Taylor, & Wood, 2012). These statistics suggest that more wellness promotion and implementation during the school day, beyond physical education, might be necessary to help improve adolescent physical wellness and academic achievement.

Wellness Programs in Middle Schools

Excessive time spent on sedentary behaviors throughout the day, such as watching television, playing video games, and additional screen time activities has also led to an increase in adolescent inactivity (Lou, 2014). To counter the shift in sedentary behaviors, schools should educate students and develop wellness programs that focus on the importance of living a healthy lifestyle. A study by Westrich, Sanchez, Strobel, and Duong (2012) indicated that a healthy schools initiative implemented in four San Mateo county school districts saw significant gains in how middle school students valued health and wellness after three years of program implementation. Despite research that consistently identifies the positive outcomes of wellness programs, schools continue to decrease physical activity, health, and physical education time for students (Lou, 2014). In a survey, seven out of ten parents stated that their child does not receive daily physical education and are concerned about the amount of physical activity their children are receiving at school (Robert Wood Johnson Foundation, 2013). Thus, focusing on incorporating concepts of physical wellness into the classroom setting could be a way to increase the insufficient amount of time currently spent on health and physical activity in middle schools.

Sedentary Scheduling

In many middle schools, adolescents enter a structured environment that entails multiple classes and travel from one academic subject to the next. With traditional schedules, students spend approximately fifty minutes in each class period, and the periods run back to back. However, due to the pressure for students to perform well on state assessments, some secondary schools now utilize non-traditional scheduling. This type of scheduling increases the instructional minutes per class. For example, one type of 4 x 4 block requires students to attend four ninety-minute classes per day (Zepeda & Mayers, 2006).

Students attending schools on block schedules spend even more time in each classroom, with blocks lasting anywhere from eighty to ninety minutes. The additional time devoted to English has been designed with the positive intention of increasing students' literacy skills. However, this type of scheduling means that on a daily basis, twelve, thirteen, and fourteen -year- olds actually may spend up to ninety minutes in the same classroom. Inadvertently, this type of scheduling may present more challenges to combating the issue of sedentary students at the middle school level.

Current State of Writing Instruction

According to Graham, Capizzi, Harris, Herbert, and Morphy's (2013) study of 114 middle school teachers, even with implementation of the more writing driven Common Core State Standards and longer instructional periods, middle school students are not performing writing tasks or receiving strong writing instruction.

> "students typically spend little time writing (with writing without composing being the most common writing tasks) or being taught how to write. While teachers used evidenced- based writing practices and made adaptations for struggling writers, these procedures were applied infrequently. Teachers further made little use of technology for writing, supporting students' writing efforts, or teaching writing. Finally, too many teachers did not receive adequate preparation from their college program, school, or school district to teach writing" p.1041.

Thus, even though educators are increasing their focus on writing in the classrooms, some educators still are not providing students with consistent writing instruction. Although technology has opened the door for creative writing experiences, the study revealed teachers still hesitate to utilize technology for these purposes. In some cases, teachers said their lack of writing instruction traces back to the lack of support and preparation for teaching writing.

Limitations in Teacher Preparation

Teachers have the greatest potential to make an impact on the physical wellness and academic achievements of America's youth. Nevertheless, concepts of physical wellness for children are often left out of teacher preparation programs (Cavillini, Wendt, and Rice, 2007). A knowledge base absent of physical wellness concepts leaves future teachers unprepared to connect

it to classroom curricula. Subsequently, it becomes a challenge for teachers to integrate a subject they are unfamiliar with.

Along with a lack of knowledge in the area of physical wellness, future teachers also lack the knowledge and skills necessary to effectively teach writing. With the strong emphasis on reading in teacher preparation programs, the pedagogy of writing goes by the wayside. Only 43.8% of teachers reported college preparation to teach writing to learn (Ray, Graham, Houston, and Harris, 2015). Therefore, teachers may lack preparation to not only incorporate direct writing tasks but also tasks designed to enhance learning.

Another reason there may be a lack of emphasis on physical wellness and writing in teacher preparation programs is a gap in the literature that focuses on the importance of wellness and writing at the secondary level. A majority of the available research converges on the impact that physical wellness has at the elementary level. However, the aforementioned statistics suggest a high prevalence of obesity occurs during adolescence and that teachers report a low value placed on preparation to teach writing. The lack of research and current deficiencies in wellness and writing justify the need for teacher education instructors and future secondary teachers to understand the significance and connection of both physical wellness and writing to their courses and classrooms. This can be accomplished by emphasizing the teaching of wellness and writing throughout curricula via a pedagogical framework to decrease the areas of weakness. A suggested framework is provided below.

Creating the Framework

The first step to developing a framework that emphasizes the teaching of wellness is to introduce physical wellness concepts to preservice teachers during teacher preparation courses. Teacher education instructors should first acquire a knowledge base of wellness concepts for integration into their area of expertise. This will aid them in providing students with appropriate and meaningful instruction. To accomplish this, an expert in the field of physical wellness should work with teacher education instructors and secondary education teachers before implementation of integration occurs. In the higher education setting this technique includes the wellness expert working alongside instructors to assist in restructuring syllabi. This restructuring should include exemplar lessons that integrate physical wellness into course content. For example, an instructor who teaches a social studies methods course may choose to demonstrate to preservice teachers how to teach about community and civic actions. With recycling as an example, the instructor may model a lesson that demonstrates the recycling process through physical movement that meets both academic and health and physical education standards. Once instructors identify effective ways to integrate wellness concepts into course content, they can begin applying it across disciplines. It is important to remember that physical wellness connections are best suited for methods courses in teacher preparation programs, as most students are readily familiar with planning and instruction at this point in their professional preparation.

In the secondary school setting, an expert in physical wellness could be hired to provide professional development on the integration of physical wellness across content areas. Additionally, health and physical education teachers are significant resources who can help guide teachers that might be uncomfortable or unfamiliar with wellness concepts.

In addition to wellness, teacher education instructors and current secondary classroom teachers must place further emphasis on writing instruction. Oftentimes, literacy courses are commonplace in secondary English education programs. However, the focus usually lies on reading and not writing instruction. Addressing writing across the curriculum in social studies, science, and math classes may help core content area teachers integrate more writing in disciplines other than English language arts. Shifting to writing to learn instruction may also show teachers of all disciplines how writing increases content knowledge and how writing may enhance overall learning in all content areas. Current and future teachers must incorporate effective writing instruction into their daily instruction in order for student performance to increase. Students and teachers must view writing as a vital component of literacy and learning. One way to create this bridge is to connect physical wellness to writing instruction for meaningful learning.

Changing the Mindset

A paradigm shift in how wellness and writing are perceived and cultivated is imperative. This fundamental change must begin at the teacher preparation level. As aforementioned, accruing a knowledge base and appreciation for the importance of wellness and writing in the curriculum is the first step. Teachers at all levels must then make a concerted effort with guidance from wellness and writing experts to design curricula for their students that demonstrate the interconnections of

wellness and writing across all disciplines.

In some cases, preconceived notions of what wellness or writing should look like may intimidate educators. For example, teachers may hesitate to consider themselves "real writers" simply because they do not keep a journal or write novels in their spare time. Teachers may not consider themselves experts on wellness because they aren't members of a gym. It is important for educators to understand there is no single image of either wellness nor writing; each individual brings his or her own unique set of skills to the table.

Integrating Wellness and Writing

Utilizing integrated learning techniques in teacher preparation courses and secondary classrooms are a realistic solution to the current wellness and writing deficiencies. With time constraints in most classrooms, integration ensures that all standards and objectives are met within the instructional timeframe (Jones, 2009). Even though research suggests it initially takes ample time to create integrated units, the time saved teaching integrated units and the positive student outcomes offset that time (Miller, 2011). Integrated learning is also important to students' "lifelong learning habits, academic skills, and personal growth" (Jones, 2009, p.78). Furthermore, research indicates that students in integrated programs demonstrated academic performance equal to, or better than, students in discipline-based programs (Miller, 2011). The integrative learning theory also implies that students are able to make better connections across the curriculum when learning is integrated. Thus, enhancing the learning process and preparing students for the twenty-first century.

Connecting the Concepts

When developing a unit that integrates wellness and writing, it is essential to find a correlation point between the two subjects' standards. In the sample unit provided (see Appendix A), the wellness concept of circuit training is applied to writing an essay and running a marathon, as it takes similar training to attain both. Using the National Writing Project Writing Marathon model, students engage in the practice necessary to develop needed writing endurance skills. Students also practice and develop physical skills through a circuit in order to attain the strength and endurance needed to successfully complete a marathon. All of these skills successfully meet the grade level standards.

Training Through Circuits

Circuit training is one of many approaches to preparing for a marathon. It is especially helpful for beginning runners, as it enables the body to simultaneously develop aerobic fitness and strengthen running muscles. Circuit training is also a viable method for writing, as it trains the writer to develop stamina over time. Additionally, circuit training involves arduous practice in which muscle and writing strength gradually increase. The circuit training unit provided (see Appendix A) was developed for a middle school English classroom and can also be accessed at the following link – Wellness and Writing Unit.

Current Changes in Teacher Preparation

Even though implementing integrated units such as the above may help alleviate the wellness and writing deficiencies in current secondary classrooms, additional steps need to occur for a fundamental change to transpire. The University of Mississippi has recently committed to making a change by offering a twelve-hour endorsement to education majors in wellness and physical activity. Approved by the Mississippi Department of Education in June, 2015, the endorsement prepares educators to integrate research-based pedagogy utilizing concepts of wellness and physical activity to activate the brain and body in an academic setting. With practical application as part of the coursework, students will graduate from the teacher preparation program with a knowledge base in wellness that prepares them to make an impact on the wellness of future generations of adolescents.

Schools of Education are also addressing the need to emphasize writing instruction. For example, at Indiana University Southeast, writing is a central component of the School of Education undergraduate teacher education program. Dr. Kevin Bailey, Professor of English Education at Indiana University Southeast, states, "Teaching Reading in the Middle and High School class at IU Southeast combines methods of reading and writing across the curriculum. In keeping with the belief that writing to learn and writing to demonstrate learning go hand-in-hand with reading comprehension and retention, undergraduates practice everything from admit slips and quick writes to analytical and on demand writing." Dr. Bailey also stated providing students with authentic writing opportunities designed to prepare future teachers for lifelong learning is key. Bailey explains, "One real world experience that immerses students into strategies and networking is the requirement that they attend a state or local writing conference, collect resources, and peer reflect on the experience in class."

CONCLUSION

The lack of inactivity in adolescents and lack of teacher preparation for writing, both of which have led to deficiencies at the secondary level has been well documented through research. These deficiencies are cause for a rudimentary change in both teacher preparation and secondary classrooms. Incorporating writing and wellness can help bring two sometimes deemphasized, yet crucial elements of middle school students' education to the forefront in a creative and unique format. A change at the teacher preparation level through teacher education course modification to include more wellness and writing could cause a positive chain reaction to occur in secondary classrooms around the country.

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APPENDIX A
Wellness and Writing Integrated Unit

Health Standards

Standard 1: Students will comprehend concepts related to health promotion and disease prevention to enhance health.

Standard 7: Students will demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks.

Physical Education Standards

Standard 1: The physically literate individual demonstrates competency in a variety of motor skills and movement patterns.

Standard 4: The physically literate individual exhibits responsible personal and social behavior that respects self and others.

Standard 5: The physically literate individual recognizes the value of physical activity for health, enjoyment, challenge, self-expression and/or social interaction.

Common Core State Standards - English Language Arts

CCSS. ELA- Literacy. WHST. 6-8.10 (6-8 example)
Write routinely over extended time frames (time for reflection and revision) and
shorter time frames (a single sitting or day or two) for a range of discipline-specific tasks, purposes, and audiences.

CCSS. ELA-Literacy. WHST.6-8.4 (6-8 example)
Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

CCSS.ELA-Literacy.WHST.6-8.5 (6-8 example)http://www.corestandards.org/ELA-Literacy/WHST/6-8/5/
With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

CCSS.ELA-Literacy.W.8.3 (Eighth grade example)http://www.corestandards.org/ELA-Literacy/W/8/3/
Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.

CCSS.ELA-Literacy.W.8.3.a (Eighth grade example)http://www.corestandards.org/ELA-Literacy/W/8/3/a/
Engage and orient the reader by establishing a context and point of view and introducing a narrator and/or characters; organize an event sequence that unfolds naturally and logically.

Objectives

Students will:
- Demonstrate proper running form
- Define and identify the purpose of circuit training for wellness
- Demonstrate cooperation with circuit station group members during writing and physical activity tasks
- Perform warm up, leg, arm, core and full body exercises that prepare the student for running
- Perform a ten and fifteen minute run that simulates building up to a marathon
- Describe the similarities between wellness and writing
- Measure the distance they have run utilizing a pedometer
- Write routinely for sustained amounts of time
- Reflect on their own writing and their peers' writing
- Revise personal composition pieces
- Engage in peer revision
- Engage in speaking and listening practice through sharing composition

Preparing the Circuit Lesson

Before the unit begins there are several things to prepare for and keep in mind. Materials for the unit include cones that are twelve inches or taller. These are used to mark the circuit stations and attach the circuit station instructions to. Additionally, circuit station instructions should be printed out and taped to the cones (see Circuit Station Directions). A writer's notebook is also needed for each student. This notebook is to be designated for writing only. The type of notebook varies; for example, some teachers/students prefer composition notebooks, some journals, and others binders divided into sections. (The important concept is the students have a designated notebook just for writing.)

A concern for many teachers who choose to implement physical movement into a lesson is the availability of space. Therefore, it is imperative to address the physical space to be used during the unit prior to teaching. Although an outside space would be ideal, utilizing the classroom is possible. When using a classroom, it is best to push the desks or tables to the middle of the room to create a circular perimeter. Cones or physical features of the room could be used as markers to identify where each segment of the circuit begins and ends.

Proceeding through the Circuits

As an opening question, ask students if they have ever seen a circuit or participated in circuit training. Upon feedback, split the class up into heterogeneous groups and engage students in creating their own definition of circuit training. You may ask the following questions to probe discussion: What is the purpose of circuit training? How many exercises are appropriate in a circuit? How is using a circuit in writing an essay and running a marathon similar? What types of exercises might you use in a circuit to develop your essay writing and running skills? If technology is available, have students type their group definitions into a pre-made class Google document or students can write their definitions on a small piece of poster board to share with the class. Our definition of circuit training is, "A type of conditioning that focuses on strength and endurance." To add a visual reinforcement to the lesson's content, have students view the video titled Circuit Training-Rationale at the following website- https://www.youtube.com/watch?v=SzfWqrYSM2c. After watching the video, have a whole group discussion on how circuit training can help students in both wellness and writing.

Next, place students into groups of four to complete both wellness and writing circuits. These circuits are to be completed at six different stations over four days with the purpose of helping students develop both wellness and writing skills simultaneously.

Day 1. Circuit station one and two: On the first day of circuit training students begin at circuit station one. Explain to students that they will stay with their groups throughout the unit. Students should not all be at the same circuit, so decide where you will place the cones for circuit station one. They may be set up in the classroom or around the school in varying locations. (Note: If it is possible to move about the school and write in different locations, the students could benefit from this experience. The students do not have to write about their surroundings (although they certainly may do so), but writing from different spaces allows exposure of writing in varying environments.

For each circuit, place a cone with circuit #1 written on it and a corresponding instruction sheet that explains what the group should do to meet both the writing and wellness component of that particular circuit. It will take approximately 15-20 minutes for the wellness and writing activities at each circuit. Explain that circuit station one helps students prepare their brain and body for both writing and running. Although circuits can be developed for different areas of a writer and runner's strengths and weaknesses, our circuits focus on building stamina to write an essay and complete a long distance run, such as a 5k marathon.

At station one students will read the instruction sheet provided and perform the dynamic stretches provided to warm-up their body. These stretches should be demonstrated prior to beginning this unit. The stretches consist of arm scissors, ankle rolls, neck and shoulder warm-ups, leg swings, toe walks, and heel walks. The duration and repetition for each exercise is provided on the instruction sheet. Upon completion of their warm-up, have students discuss the purpose of warming up prior to completing any physical activity. The discussion also serves as a writing warm up. Next, the teacher will set a timer for ten minutes, and the students will write in their writers' notebooks about the physical and mental preparation of their exercises. Students may choose their method of composing: narrative, expository, poetry, etc. When the writing time is completed, students should read aloud their writing to their group members.

Upon completion of circuit station one, students will travel with their group to circuit station two. In between each station, students will perform form exercises for running. From station one to two, students will practice good form by completing high knee exercises. The explanation for high knees is provided on the bottom of the circuit station one directions page. These should be completed for 15-20 second intervals between the two stations. Explain to students that it is okay to rest, but they should not stop their body from moving and should continue to walk.

Once students arrive at circuit station two, they will complete the same process as station one. However, the focus for station two is on the core, which is the next part of the body that is required to build strength and stamina for running. Students will also complete an additional timed writing section to build writing stamina. The core is essential for stabilizing the upper body and enabling students to maintain an upright posture. By increasing core strength, runners are able to breathe more efficiently and avoid energy-wasting movements of the upper body. To increase core strength, students will perform crunches, planks, and prone extensions at station two. Instructions for correct performance, repetition, and duration of these exercises is included on the directions for circuit station two. Upon completion of the core circuit, students will begin their timed writing. Add two minutes to the writing time for twelve sustained minutes of writing. Students again will read aloud their writing in small groups.

Day 2. Circuit station three and four: At the beginning of day two, review with students the purpose of a circuit and remind them that they are learning how to build stamina and strength both mentally and physically through the completion of six circuits. It is important for students to understand the interconnectedness and real-world application of this unit. Building endurance and stamina in life is imperative to proceeding through almost any daily task. Effective practice is what makes us better at almost any skill!

The circuit focus for day two will be on a longer timed writing session and leg and arm exercises. Leg and arm exercises develop multiple muscle groups, which helps to develop a stable upper and lower body and improved posture for running. Before completing leg and arm exercises, students will make the transition to station three by completing a walk (2 minutes), run (2 minutes), walk (2 minutes) series. This can be completed in place if physical space is limited. Leg exercises that students complete at circuit station three include toe raises, side leg raises, squats, and lunges. The building transition from circuit station three to four will be another run, walk, run period. However, the time increases to three minutes for the run, walk, run. Arm exercises for circuit station four include push-ups and wood chops. After finishing the exercises have groups discuss the importance of developing upper and lower body strength for runners.

For the writing segment of circuit station three and four, students will repeat the same process as above, adding two minutes of writing time with each station resulting in station three writing time of fourteen minutes and station four writing time of sixteen minutes.

Day 3. Circuit station five: This day will consist of whole body workouts and essay revisions. Remind students of all the work they have completed up to this point to exercise each part of the body, as well as write each part of the essay. To begin the transition building, students will complete a short distance run in place. The distance should be the focus of the run and not the time. Students may wear a pedometer to measure their distance over ten minutes. Next, students will begin at station five by demonstrating whole body exercises to include high knee skipping and mountain climbers. Utilizing the whole body is the last step of the process before running a marathon, just as peer

revising at station five is the last step in the process before writing a timed essay. Encourage students to point out the similarities between writing and running up to this point.

At this point, students have read aloud four pieces of writing in small groups, one from each station. Groups will help each member decide on a piece of writing to polish and share with the whole group. Each group member should give each person of the group one praise and one suggestion for revision on the chosen piece. Next, the students will utilize revision suggestions and revise their draft.

Day 4. Circuit station six: On the last day of this unit, students will perform in both writing and running. For the transition building to circuit station six, students will complete a longer timed run that will be representative of a marathon. Have students time their fifteen-minute run and document the amount of steps taken. Inform students that they may walk in between if they need to take a break. Be sure students warm up before the run and remind them to keep in mind all of the points they have discussed throughout the unit. Students individually will edit their chosen piece of writing and then share at circuit station six. This will be read aloud to the entire class.

Circuit Station #1 Directions

Warm-Up

Task #1: At this station you will warm-up both your brain and body to prepare for running and writing. To begin, perform the following circuit warm-up exercises as a group.

Arm Scissors - Stand with the feet shoulder-width apart. Hold arms straight out to the sides and parallel to the ground. Swing the arms in front of and behind the body in a wide crisscrossing, or scissoring, motion. With every swing, alternate the top arm. (2 minutes)

Ankle Roll - Sit cross-legged on the ground. Grasp your right foot with both hands and rotate the ankle with slight resistance from your hands for 10 seconds, then reverse directions. Repeat on the left side.

Neck and Shoulder Warm-Up - For the Neck Warm-up, stand tall and relaxed, drop the chin toward the chest, and gently roll your head toward one shoulder in a semicircular motion. Roll it back to the front and around to the other shoulder. Do not let your head fall too far backward, as this can strain the neck and spinal cord. For the Shoulder Warm-up, stand tall and relaxed, then rotate the shoulders in a big, smooth, circular motion. Bring the shoulders back, then up toward the ears, and then forward and down. (2 minutes)

Leg Swings - Brace the body against a wall or the other support by holding one arm out to the side at shoulder height. Keep the body stable and balanced, keeping the back straight. Start with both feet directly under the hips and then swing the inside leg forward and backward. Gradually increase the range of motion until the leg swings as high as it will comfortably go. (20 x each leg)

Toe Walk - Stand tall with good posture, keeping your shoulders back. Raise both heels and balance on the balls of your feet. Step forward with your left leg and push into the ground with the ball of your left foot, trying to extend up onto your toes. This movement will activate the contraction of the calf muscles. Step forward with your right leg and repeat the process. Continue alternating legs. (2 minutes)

Heel Walks - Stand tall with good posture, keeping your shoulders back. Raise your toes off the ground. Step forward with your left leg and push your body-weight into your heel, pointing your toes to the sky. This movement will activate the anterior tibialis (the muscle that runs down the front of your leg from your knee to the ankle area). Step forward with your right leg and repeat the process. Continue alternating legs. (2 minutes)

Task #2: Timed Writing- Begin writing in your journal when the teacher says, "On your mark, get set, write!" Continue writing until the timer sounds. If you reach a "writing block", continuously write the words "I don't know" until you break through your writing block. Do not stop writing until the timer sounds. Next, each member of the group will

share his or her writing. Acknowledge each person's group share by stating, "Thank you for sharing your writing with us."

***After completing your timed writing and group share, walk to the next circuit station with high knees. Correct form is provided below. Try to accomplish this in 15-20 second segments. If you get tired, just continue to walk.**

High Knees - Maintain an upright body position while bringing the knee level with the hip and pulling the toe up towards the shin. Alternate legs quickly, while taking very small steps forward. Move arms in a coordinated fashion with legs as if running.

Circuit Station #2 Directions

Building the Core

Task #1: At circuit station two you will focus on building core and writing stamina. Both are important to developing the skills necessary to perform running and writing at your highest potential.

Crunches - Perform crunches in two minute intervals and take a two minute break in between for eight minutes. During the two minutes, perform as many crunches as you can.

Step 1: Lie on your back with knees bent, feet flat on the floor roughly shoulder-width apart.
Step 2: Place fingertips on the back or sides of the head with elbows pointing outward.
Step 3: Take a deep breath and while exhaling, contract the abs and raise the chest and head until the shoulder blades are 1-2 inches off the floor.
Step 4: At the same time, pull the belly button towards the spine and flatten the lower back against the floor, squeezing the abs tightly.
Step 5: While inhaling, lower the shoulders back down until they are just above the ground.

Performance Points:

- Keep the neck long and raise the chin to avoid straining the neck.
- Relax the neck by using the hands to support the weight of the head.
- Never pull the head up with the hands or interlock fingers behind the head
- Breathe deeply and rhythmically throughout the exercise,
- exhaling when going up and inhaling when coming down.
- Lift both the chest and the head to achieve more of a lift than a curl.
- Keep lower back on the ground.

Planks

Step 1: Lie flat on the ground and prop up the upper body using your forearms.
Step 2: Curl the toes under and prop up the lower half of the body.
Step 3: With the whole body parallel to the ground, hold the plank for 10 to 30 seconds and do 2 to 4 repetitions.

Prone Extension/Superman

Step 1: Lay on stomach with arms overhead.
Step 2: Lift arms and legs so upper chest and upper thighs lift off surface, engaging spinal extensors. Arms and legs should be straight.(3x, 20 seconds each)

Task #2: Timed Writing Writing - Begin writing in your journal when the teacher says, "On your mark, get set, write!" Continue writing until the timer sounds. If you reach a "writing block", continuously write the words "I don't know" until you break through your writing block. Do not stop writing until the timer sounds.

Next, each member of the group will share his or her writing. Acknowledge each person's group share by stating, "Thank you for sharing your writing with us."

Circuit Station #3 Directions

Lower Body - Leg Exercises

Task #1: This circuit requires you to build strength in your legs. In order to run long distances, runners need to develop strength and endurance in their lower body.
Complete the following leg exercise circuit.

Toe Raises
Step 1: Stand facing a wall or chair and place one hand against it for support.
Step 2: Slowly stand up on your toes, and then slowly lower heels to the floor.
Perform 10 to 20 repetitions.

Side Leg Raises
Step 1: Lie on your side.
Step 2: Align the upper leg with your body and bend the bottom leg at the knee.
Step 3: Lay your head on the outstretched bottom arm and bring the top hand across, placing it palm down in front of chest for support.
Step 4: Slowly lift your upper leg, leading with the heel, as high as you comfortably can. Slowly lower it to the starting position and repeat.
Step 5: Do not move the upper leg in front of your body. Keep your toes pointing forward.
Step 6: Perform 10 to 20 repetitions with each leg.

Squats
Step 1: Stand upright with feet flat on the ground and shoulder-width apart.
Step 2: Slowly and fluidly bend your knees and the lower the body, extending the arms out in front.
Step 3: Pause for two to three seconds
Step 4: Slowly raise back up and then repeat the action. (1 minute)

Performance Points:
- In the ultimate squat the angle of the knees will be 90 degrees and the thighs will be parallel to the ground. Squat within your own limits. Do not let the hips sink lower than the knees.
- Keep the knees behind the toes. To help, imagine sitting back in a chair.
- Maintain an upright posture. A slight forward lean is okay.
- Keep chin up and parallel to the ground and feet and knees pointing forward.

Forward Lunges
Step 1: Stand upright with feet shoulder-width apart.
Step 2: Step 2 to 3 feet forward with one foot and lower into a lunge position.
Step 3: Hold for one to two seconds
Step 4: Pushing off the front foot, return to a neutral standing position.
Step 5: Repeat the lunges, leading with the opposite foot. (1 minute)

Performance Points:
- In a lunge position, the front knee should be bent at about 90-degree angle while the back knee angle hovers between 90 and 120 degrees.
- Keep the back straight and the shoulders over hips
- Do not let the hips or torso twist or drop to one side.
- Tighten the core muscles
- Point the toes and knees forward.
- Keep the front knee over the ankle not the toes.

Task #2: Timed Writing - Begin writing in your journal when the teacher says, "On your mark, get set, write!" Continue writing until the timer sounds. If you reach a "writing block", continuously write the words "I don't know" until you break through your writing block. Do not stop writing until the timer sounds.

Next, each member of the group will share his or her writing. Acknowledge each person's group share by stating, "Thank you for sharing your writing with us."

*Travel to the next station by completing a walk (3 minutes), run (3 minutes), walk (3 minutes) exercise. Be aware of your posture and breathing during the transition

Circuit Station #4 Directions

Upper Body-Arm Exercises

Task #1: This circuit requires you to practice arm strengthening exercises.

Push-ups
Step 1: Place the hands on the floor slightly wider than shoulder-width apart.
Step 2: Raise the body so that only the hands and toes support it.
Step 3: Lower the body down to about 1 inch off the ground and then raise it back up to where the arms are straight.
Step 4: For a modified version, keep the knees on the ground.
Step 5: Keep the body in a straight line, with no raising or sagging of the knees, hips, back, or head.
Step 6: Lower the body to about 1 inch off the ground without touching it.
(2 minutes)

Performance Points:
• Do not lock the elbows when fully extended.
• Raise and lower the body slowly using controlled movements
• Exhale while pushing up; inhale while lowering down.

Modified Push-ups
Step 1: Position your hands as you would for a regular push-up.
Step 2: Bend your knees and rest them on the ground. Cross your ankles and hold your toes off the ground. Lower yourself like a regular push-up.
Step 3: Keep your knees in contact with the floor while keeping your back straight and your head aligned with your spine.
Step 4: Straighten arms fully at the top of the push-up.

Wood Chops
Step 1: Seated with both hands together, lift arms up over one shoulder
Step 2: With control, lower arms across body to opposite hip
Step 3: Repeat movement to both sides.
(2 minutes)
• Add a little: Perform exercise in varied positions, such as standing, tall kneel and half kneel.
• Add a little more: Perform exercise with the resistance of holding elastic tubing secured to a table leg.
• Add a small ball: Hold the small ball (weighted, if possible) and perform movement. Or play catch with someone behind them.
• Add a larger ball: Perform exercise while seated on the larger ball.
• Make it fun: Use a plastic bat or wrapping paper roll to swing or simulate sword movements to knock down toys, have a play sword fight or swipe at balloons.

Task #2: Timed Writing - Begin writing in your journal when the teacher says, "On your mark, get set, write!" Continue writing until the timer sounds. If you reach a "writing block", continuously write the words "I don't know" until you break through your writing block. Do not stop writing until the timer sounds.
Next, each member of the group will share his or her writing. Acknowledge each person's group share by stating, "Thank you for sharing your writing with us."

Circuit Station #5 Directions

Whole Body Exercises

*Prior to completing this circuit, you will complete a timed run for 10 minutes in place. You may walk, jog, run or vary your exercises during the ten minutes. This will help build your stamina for a marathon.

Task #1: This circuit asks you to perform exercises that require the use of all muscle groups. Think about all of the muscles that are being used as you complete the exercises and how they will help you as a runner.

High-Knee Skipping
Note: You can do this while moving slowly forward or standing still.
Step 1: From the balls of your feet, raise your knee up higher than 90 degrees, while moving your arms as you would during running.
Step 2: Bring your leg down and raise the opposite knee higher than 90 degrees. This motion should develop a slight hopping cadence. Start off doing three repetitions for 30 seconds each and build up to doing three repetitions for two minutes each.

Mountain Climbers
Step 1: Get into a pushup position.
Step 2: Bring your right knee in, then extend it back.
Step 3: Bring your left knee in, then extend it back.
Step 4: Alternate legs and move as fast as you can while maintaining good form.
Do three sets of 10 reps counting right and left together as one set.

Task #2: Timed Writing - Begin writing in your journal when the teacher says, "On your mark, get set, write!" Continue writing until the timer sounds. If you reach a "writing block", continuously write the words "I don't know" until you break through your writing block. Do not stop writing until the timer sounds.
Next, each member of the group will share his or her writing. Acknowledge each person's group share by stating, "Thank you for sharing your writing with us."

Circuit Station #6 Directions

Task #1: Today you will run for fifteen minutes. Remember that the focus is on the time and not the distance. Everyone will progress with distance differently. Although you will not complete the 13.1 miles that is required of a half-marathon, you have now acquired the skills and stamina that would enable you to train successfully for a marathon in the future. After completing your fifteen-minute run in place, discuss with your group members the skills that you have attained that would make you successful in completing a half marathon in the future. Ready…GO!

Task #2: As a group, help each group member decide which piece of writing he or she should develop further. Offer each group member suggestions on what to add, delete, or explain in more detail to his or her writing piece.
Next, take the piece of writing chosen by your group for further revision and revise for ten minutes. Finally, be prepared to share the writing whole group. Look to the class member sitting in the author's chair at the front of the room. Listen attentively while each class member shares his or her writing with the entire class. When it is your turn to read from the author's chair, begin by saying, "My name is _____, and I am a writer."

Video Game Effects on Training College Students' Reaction Times: A Small-Scale Study

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Abstract: Fast decision making may lead people to make more errors, but it remains uncertain whether reaction time (RT) can be reduced with appropriate online training across various tasks. Research has shown that the more gamers are actively involved in a shooter game, the more they show faster and more accurate attention allocation, enhanced mental abilities, and higher spatial resolution in visual processing (Barlett et al, 2008; Bavelier, Green, & Seidenberg, 2013). The present study investigated the relationship between two different computer game plays and how the act of playing action video game significantly decreases college students' RTs. Through the use of one-way ANOVA and the independent sample t-test, significance between the three groups was found ($F(2, 45) = 6.18$, $p < .01$). Video gaming may provide a possible training regimen to induce the participants' processing speed of perceptual reaction times.

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Keywords: action-based game, instructional technology, logic-based game, reaction time (RT), online learning

INTRODUCTION

Recent studies suggest that repetitive practice of action video games may enhance various cognitive functions in young adults, such as visual attention and reaction time (RT) (Dye, Green, & Bavelier, 2009; Feng, Spence, & Pratt, 2007; Strobach, Frensch, & Schubert, 2012). Green and Bavelier (2003, 2006) found that gamers showed higher level of visual attention capacity than non-gamers. These studies also showed that active video gamers (i.e., participants who played action games for more than 10 hours per week) were more likely to optimize their executive controls, since action video games were fairly similar to real-life situations that helped gamers generate a structured environment for better online learning. A later study by Green and Bavelier (2013) also found that participants who played a shooter video game, or action game, showed faster and more accurate attention allocation, higher spatial resolution in visual processing, and enhanced mental rotation abilities. In particular, spatial skills improvements derived from playing the available shooter (action) video games are comparable to the effects of college-level courses aimed at enhancing online learning. Uttal and collaborators (2013) reported that spatial skills can be trained with video games in a brief period, but the benefits of the training are likely to last over an extended period of time. In their meta-analysis, the authors concluded that the transfer effect to other spatial tasks can be used for instructional technology.

Research has shown that video games may promote individuals' executive control (Feng et al., 2007; Green & Bavelier, 2006; Strobach et al., 2012). The term refers to a set of processes that a person needs to manage oneself and one's resources in order to achieve a certain goal. Executive control enables a person to pay attention to important events, remember instructions, plan things,

and complete multiple tasks appropriately. Promoting executive control may lead people to experience long-term benefits. Different video games help people collect visual and auditory information more efficiently (Boot, Kramer, Simons, Febiani, & Gratton, 2008; Bavelier, Green, Han, Renshaw, Merzenich, & Gentile, 2011; Green & Bavelier, 2003).

Playing action video games can also train people to make the correct decisions faster. The more people make the right decisions faster, the more they are likely to decrease their reaction time as well as, increase their cognitive ability to process the information received from the stimuli (Strobach et al., 2012). Video games are inherently multisensory, with many action video games often having both auditory and visual cues that are relevant to an appropriate behavioral response. High-action, first-person shooter games combine intense visual graphics with corresponding and informative auditory cues and feedback, and can involve multiplayer interactions wherein players communicate with each other via auditory conversations (Donohue, Woldorff, & Mitroff, 2010; Strobach et al., 2012). Video gaming technology in this respect can be a powerful platform by which reaction time can be evaluated. Specifically, given that action video games bombard the players with multisensory stimuli that must be processed rapidly and accurately, it can be hypothesized that people known to be action game players are more likely to parse audio-visual information when the players occur closely together in time (Donohue et al., 2010).

RT is another important research concept in the field of cognitive psychology. It is defined as the time between the initiation of a sensory stimulus and the amount of time lapsed before the person actually responds to that stimulus (Strobach et al., 2012). This type of latency is usually measured in milliseconds. RT is a core component in a perceptual-motor task that shows the content, duration, and temporal sequencing of cognitive processes depends on neurons and neural pathways and is linked to a body structure (Donohue, et al., 2010; Medina, Wong, Díaz, & Colonius, 2015). RT is a physical skill closely related to human performance. It also represents the level of neuromuscular coordination in which the body, through different physical, chemical and mechanical processes, decodes visual or auditory stimuli traveling via afferent pathways and reaching the brain as sensory stimuli (Shelton & Kumar, 2010).

THEORETICAL FRAMEWORK: RESEARCH HYPOTHESIS

RT is closely related to executive control skills, which are involved in the processing of rapid switches between two (or more) tasks. The concept also indicates the speed at which the individual can execute the mental operations needed in order to manipulate the tasks presented by his or her action video game. Certain situation of action video game playing can be utilized as a learning module for enhancing executive control skills, because action video games require the rapid performance of various actions. Those actions are often performed simultaneously (or within close time proximity during the game) and because of that reason, the individual needs to make his or her decision faster in order to achieve the primary goal and move him or herself forward to the next level (Boot et al., 2011; Strobach et al., 2012).

Video gaming may therefore provide an efficient training regimen to induce a general quickening of perceptual reaction times without a decrease in accuracy of performance. The aforementioned studies found that active video game play may have positive effects on some executive functions with implications for real-world behavior. Feng and colleagues' 2007 study also concluded that action-game playing may provide a reliable training regimen to reduce gender differences in visuospatial cognition. The effects of logic video games may be positively correlated with people's decision making, risk-taking, and problem solving (Boot et al., 2011; Feng et al., 2007; Strobach et al., 2012).

The study, therefore, investigated the effects of two different video games (i.e., logic and fast-paced action games) play on college students' reaction time. The study also examined whether those students' reaction time improved when they increased their correct response rates. Overall, the aims of this study were to identify whether reaction time could be decreased by playing action-based video games and to investigate whether executive function could be enhanced due to playing video games. Based on the above studies showing that video games could cause an increase in executive functioning, it was hypothesized that video games would shorten the participants' reaction time. It was also predicted that the action game group's reaction time would be faster than that of the logic game group, because action games have been found been to lead to an increase in executive control skills.

METHODOLOGY

Research Design

The one-way analysis of variance (ANOVA) was used to determine whether there were any significant differences between the means of three independent groups (i.e., control, logic, and action groups). The independent variables are the membership of three groups. The dependent variable was the participants' reaction time. The independent sample t-test was then used to decide if there was a statistically significant difference between the means of the two unrelated groups.

DATA COLLECTION PROCEDURES

Participants and Setting

60 participants (N = 60) were recruited from a large lower division introductory psychology course at a small, liberal arts college in Southeastern Arkansas. Those people who participated in the study received partial course credit for their completion of the study. Age, race, gender, and other defining properties were not considered as important factors for the study, so demographic information was not collected. 12 participants were excluded from the data analyses: these 12 participants were excluded for failure to complete the study, or due to experimenter error. All subsequent data analyses were conducted with the clean sample (N = 48). The participants were randomly divided into three groups: Control, logic, and action. Participants were not required to bring anything to the study and were allowed to depart immediately upon completion of their individual group task. All sessions were conducted in a classroom equipped with computers with internet capabilities. Participants were asked to complete all tasks on their computers on which they had started.

Procedures

Every participant was required to take a simple reaction time test on the computer lasting approximately 5 minutes. The reaction time test consisted of five short trials. The trials required the individual to click the mouse when the screen changed to a certain color. The trial began with a red screen and the participants had to wait for the screen to change to green. The test measured the participants' reaction time and correct response rate by making them to think about the color change before clicking. The test did not allow participants to make any early submissions. Once the trials were completed, an average time of each trial was computed by the reaction time program. The data were collected on tracking sheets by the researchers. All times were entered on the appropriate data sheets in milliseconds.

In the control group, each participant was asked to complete the reaction time test only. The participant was placed in front of the computer and was given instructions as to the operation of the reaction time program. The student then was instructed to begin the test when ready. Once the test started, all five trials were completed in one sitting. Upon completing the five trials of the reaction time test, the participants were free to leave.

Participants assigned to play the logic based game were called the logic group. The particular game used for this group was a physics-based game entitled Bouncy and Monsto. This game was widely known as one of the online logic games which gamers can play for free and has been rated by the Physics Games website (http://www.physicsgames.net) as a minimum of 8 out of 10 stars for difficulty rated by reviewers. Prior to beginning, the participants were given instructions as to how to start the game and how to move from the video game screen to the reaction time test screen. Each participant began by playing 15 minutes of this logic-based game on the computer. The game design required participants to logically figure out which boxes to remove from the screen in order to allow a ball to roll from one location to its final destination. Once time was up, students were given the same reaction time test that had been given to the first group and then allowed to leave the premises.

Another group was assigned to play the action-based video game (i.e., the action group). The action-based game used in this particular part of the experiment was Temple Run. The game was released in 2013. Since then, the game had been known as one of the most popular action-based video games; it involves gamers overcoming various tasks as explorers (Rubens, 2013). Instructions were given to this cluster in the same manner as to the logic group. Each participant began by playing 15 minutes of this action-based game on the computer. The game design required participants to actively participate and control a runner through a maze filled with obstacles designed to interrupt the player's game play, all while being chased. The goal is to ultimately bring the avatar used by the video game player to its demise. Each participant was required to make the runner turn right, turn left, jump, and slide based on the obstacles in the runner's way. If the participant failed to control the runner, the runner would fall to his death and the game play would end. After 15 minutes of game play, participants were given the same reaction time test as given to the other two groups.

DATA ANALYSIS

Table 1. ***Descriptive statistics of reaction time by groups***

Group	N	mean	SD	median	min	max	skew	kurtosis
Control	20	463.3	205.4	359	285	1119	1.70	2.60
Logic	10	276.2	14.9	276	255	301	0.26	-1.38
Action	18	335.7	113.9	295	266	736	2.45	5.64
total	48	376.2	166.7	311	255	1119	2.44	6.66

Table 2. ***ANOVA analysis results***

	df	SS	MS	F	value	Pr (>F)
Group	2	281298	140649	6.18	0.00425	**
Residuals		45	1024096	22758		

Results

There was a statistically significant mean difference of reaction time among the three groups as determined by one-way ANOVA ($F(2, 45) = 6.18$, $p < .01$). A Tukey post-hoc test revealed that the reaction time of the control group was statistically significantly different from that of the logic game group ($\mu = 276.2$, $\sigma = 14.94$, $p < .03$) and of the action-based video game group ($\mu = 335.7$, $\sigma = 113.9$, $p < .01$) compared to the control group ($\mu = 463.3$, $\sigma = 205.4$). There were no statistically significant differences between the logic game group and the action-based video game group ($p = .58$).

The Tukey's post-hoc procedure was then used to compare all the groups to each other in order to determine if there was significance between more than one pair of groups. The results showed that there were differences between the control group and both the logic group and the action group; however, there was no difference between the logic group and the action group. The results also indicated that the mere presence of a video game caused a decrease in reaction time; however, there was no significant difference between the logic group and the action group.

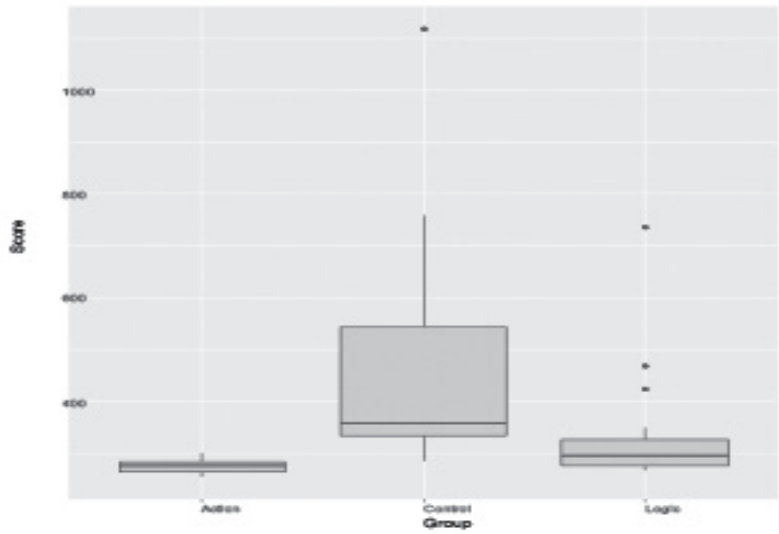
Conclusions and Implications of the Study

Previous studies have suggested that video games may cause an increase in response rate to visual and auditory stimulus. Our results, to some extent, supported those findings (Dye et al., 2009; Feng et al., 2007; Green & Bavelier, 2006; Strobach et al., 2012). One important strength of the study was the access to modern technology. Such access to modern technology helped tremendously in our data collection. The researchers were able to test all participants using a simple online reaction time test and also access from the internet the appropriate games for each participant. The participants were also able to be tested on the same computer on which they had played the designated game. The technology not only allowed us to access our games and test more quickly, but also allowed the researchers to train participants at a faster rate. Having the ability to train participants quicker allowed us to run more participants in a shorter period of time. The findings may contribute to the growing literature demonstrating the links between technology use and executive functioning. They also may have important implications for our understanding of online learning and the promotion of instructional technology.
Another strength of the study is that the results indicated an enhanced reaction time when a video game is present. The current study could lead to future research with video games as a means to promote instructional technology. As technology continues to grow, it is important to know how technology affects brain functioning. The results of this study may suggest a way to lessen students' reaction time without decreasing accuracy when they take online tests. A decrease in this particular entity among testers might be further explored as a means to better prepare students for more challenging types of online testing. As an increasing number of human interactions occur in the digital world, the development of applications should continue to be investigated objectively. Since online education has grown over the years, the number of students enrolling in online classes is beginning to overtake the number of students enrolling in the classroom (Karbach & Kray, 2009). In most US institutions, students are required to

Table 3. ***Pairwise comparisons of p-value using t-tests with pooled SD (Tukey)***

	Control	Action
Action	0.0069	-
Logic	0.0327	0.5810

Figure 1. ***Box plot of reaction time by groups***



take various online tests as a method of measuring their knowledge base on diverse subjects. Those tests are proctored with time limits. Sometimes, the amount of time allotted is insufficient to complete the assessment, but when students do not have barely enough time to supply answers, reaction time is of the essence. Shortening a tester's reaction time for written tests and online tests, as well as for the correct response rate, should make for a better overall college experience.

Although the findings showed that playing video games do cause a decrease in reaction time, our results were limited to a small number of participants for this study. Some of our participants had already played video games on a daily basis. Once they were excluded, only 48 participants were eligible for the study. It is possible that a large sample size might have led to different results.
Secondly, if there were more time to conduct the study, or if it had been conducted as a longitudinal study, it might have been possible to analyze the transfer effect of those participants who participated in two different trials with two different videogames. Allowing a little more time for game playing may have changed participants' reactions in the reaction time test. For instance, playing the action-based game longer could lead the participants to respond more quickly, or playing the logic-based game might cause the participants to think more about their decisions before responding. The researchers may have been able to produce scientific evidence to support the existing theory that playing a fast-paced action-based game rather than a logic-based game led to a greater decrease in reaction time.

Last but not least, the correction rate was not considered in the study due to time constraints. The response time was solely utilized to evaluate performance. If an equal or higher correct response rate were observed from groups of logic-and action-based games, the result could have obtained better parsimony and plausibility.

Still, this study was conducted in hopes of finding an efficient way to decrease reaction time in college

students. It was hypothesized that playing video games would cause a decrease in the participants' reaction time, because there is evidence that video games have a positive correlation with executive functioning. It was also predicted that the action game group's reaction time would be faster than that of the logic-based game group, because action games were found to have a longer lasting effect on human cognition (Dye et al., 2009; Strobach et al., 2012). Through the use of one-way ANOVA and the independent sample t-test, it was found that playing all video games cause a decrease in reaction time. The data analysis also supported the idea that video games cause a decrease in reaction time; however, the data analysis did not fully support our hypothesis that the action game group would have a faster reaction time than the logic game group. The results of both groups indicated that the mere presence of a video game may cause a decrease in students' reaction time in students to visual stimuli, but more investigation is needed.

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Severe Weather Emergency Preparedness Plan for Schools: Case Study from the Gulf Coast Region

Praphul Joshi
Faye Anderson

Abstract: This study proposes a Severe Weather Emergency Preparedness (SWEP) plan for schools of coastal communities at the Gulf States. The plan aims at adopting standard protocols that are relevant to the coastal communities, increasing the students' awareness of natural and physical environments, equipping the students with the ability to follow the right decisions pertaining to their environment, and strengthening the guardian/parent-child relationship. The plan addresses the five community resilience indicators: ecological, social, economic, infrastructure, and community competence indicators. Although the plan can be extended to benefit the community, further application and testing is required to explore its full potential.

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Keywords: Severe Weather Emergency Preparedness Plan; Schools; Gulf Coast Region

INTRODUCTION

In recent years community resilience has gained much attention around the world mainly due to singular disasters that hit on a sudden fashion. This concept has progressed to include risks that gradually develop as well. This is important as it prepares the community to more frequent threats in the short, medium, and long term. However, despite the significance of fortifying the physical infrastructure available to the community like roads, shelters, and buildings, the social structure of the community is more critical to its resilience (Holling CS, 2008). This structure based on the relationships that connect the different people around us like friends, family members, and neighbors. Nevertheless, increased strength of these relationships does not necessarily mean higher community resilience as it might be a representative of lack of social relationships or connections to outside communities that can be a backup resort when a threat strikes. This means that building and maintaining relationships at all degrees of strength is an imperative factor to building and maintaining the community's resilience.

But what is community resilience and what is it composed of? According to Torrens Resilience Institute (2009), it means to "rebound or recoil"(TRI, 2009). Norris et al. (2008) reviewed more than eight different definitions of community resilience. One seems more relevant to adapting to severe weather risks and gives insight on the complexity and multi-layered nature of community resilience: "The ability of community members to take meaningful, deliberate, collective action to remedy the impact of a problem, including the ability to interpret the environment, intervene, and move on" (Norris FH, 2008). This reflects on the comprehensive definition adopted by the National Oceanic and Atmospheric Administration (NOAA): "The capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a disruption" (NOAA, 2015).

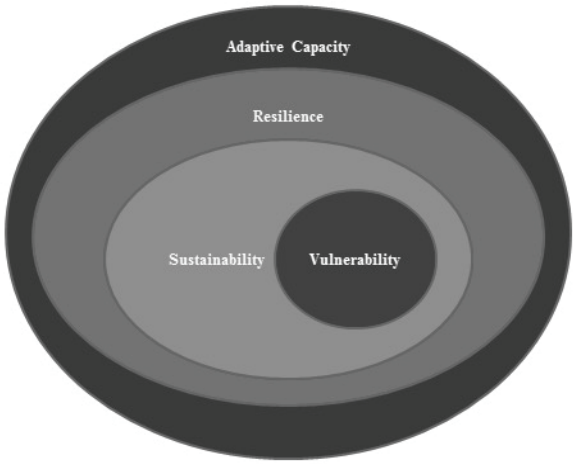

Figure 1. ***Vulnerabilities, Sustainability Community resilience***

Figure 1 presents how identifying vulnerabilities of the community is part of developing its sustainability, which in turn is necessary to build its resilience (Adger WN, 2004; Anderson F, 2015) Community vulnerabilities of Jefferson County, Texas include the decrease in quality of life indicators compared to other communities in the country. For example, 23% in poverty, 22% adult smoking, 36% adult obesity, and 33% alcohol-impaired driving deaths, 57% of children enrolled in public schools are in the free lunch program.

Communities need to draw upon their natural resources, infrastructure, financial resources, human resources, political resources, culture, and social resources (Figure 2). These resources can be developed and diversified. While they are all important, less attention has been paid to the social resources despite their significance and ability to fortify the community's adaptive capacity. Furthermore, research has shown that the social capital of a community is the most critical aspect of community

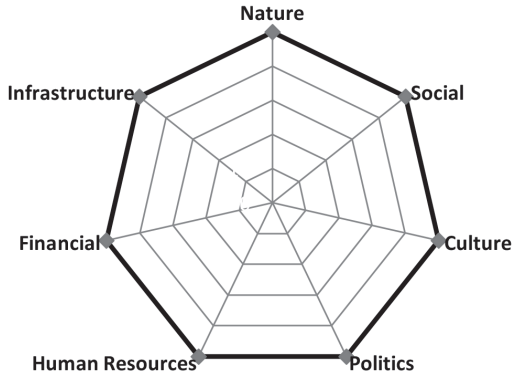

Figure 2. ***Resources Communities Can Draw Upon***

resilience, because it touches on the core of how a community functions. This social capital can be measured and fortified by the six scopes of coping with change, coping with stressful situations, making choices, being assertive, developing resilience, and being positive (Omand D, 2005; Granovetter MS, 1973).

Communities in the Gulf of Mexico region of the United States are highly vulnerable for natural disasters such as hurricanes, tornadoes and flash flooding. The Gulf-coast includes the coastal areas of Texas, Louisiana, Mississippi, Alabama and Florida. This region has witnessed numerous major hurricanes in the past decade accounting for thousands of deaths and destruction resulting in billions of dollars. Hurricane Katrina, which made landfall in the US in August 2005, alone accounted for about 1200 – 1800 deaths based on multiple reports. Hurricane Rita, that made landfall the same year accounted for about 125 deaths in Southeast Texas and Louisiana. The Gulf-coast region is fairly flat in topography and large parts of the coastal communities are at or below sea level, leading to flash flooding with severe rainfall. The Severe Weather Emergency Preparedness (SWEP) for the gulf-coast region of US has been adapted from the SWEP guide released by the National Oceanic and Atmospheric Administration (NOAA). The purpose of this guide is to provide assistance to school administrators and teachers in the Gulf-coast region in designing a severe weather emergency plan for their schools. A standard protocol for schools has been outlined in the NOAA guide that includes preparedness of schools for tornadoes, flash floods, extreme heat and hail.

Schools can better address the issues related to severe weather by increasing the knowledge of their teachers and students regarding the weather patterns. Educating the students about climate change and severe weather patterns will also make them more responsible about their environment. Implementing a SWEP plan at schools can be used as an opportunity to teach children about natural as well as built environment and enable them in making healthy decisions.

The parent-child relationship, the most salient Microsystem influence in children's lives, plays an influential role in children's reactions to and recovery from disasters (Noffsinger MA, 2012). Research has established children's vulnerability to disasters and has begun to elucidate the myriad factors that influence their reactions in the near- and long-term (Norris FH, 2002). Parents, peers, teachers, and others with whom children share intimate bonds contribute to their disaster adjustment and often provide essential support in the

post-disaster environment (Noffsinger MA, 2012). Strong connections among home, school, peer group, faith-based organizations, neighborhoods, and supportive networks and responses within social, community, and governmental agencies, can foster children's resilience and recovery in the face of adversity (Quinn M, 2006).

The objectives of this SWEP plan for Gulf Coast region are a) to adopt standard protocols to deal with severe weather as it pertains to Gulf coast communities; b) to increase the knowledge of students in natural and built environment; c) Enable skill-building among students to make healthy decisions pertaining to their environment; d) To enhance guardian/parent-child relationship by discussing issues that affect their home environment.

Conceptual Framework

As depicted in Figure 1, this SWEP plan incorporates the constructs of vulnerabilities, sustainability, resilience and adaptive capacity to be implementing in school-based settings. This plan provides an innovative approach in utilizing the above-mentioned constructs in addition to implementing standard protocols in disaster management. Detailed implementation as well as evaluation framework are developed to focus on these specific constructs of vulnerability, sustainability, resilience, and adaptive capacity.

This plan utilizes a disaster resiliency of place (DROP) model in explaining critical components of the natural disaster response. Figure 3 represents the dynamic relationship between the constructs used in this SWEP plan as well as addressing the objectives proposed in this plan. This model is designed to present the relationship between vulnerability and resilience; one that is theoretically grounded, amenable to quantification; and one that can be readily applied to address real problems in real places. The plan reduces risk posed by severe

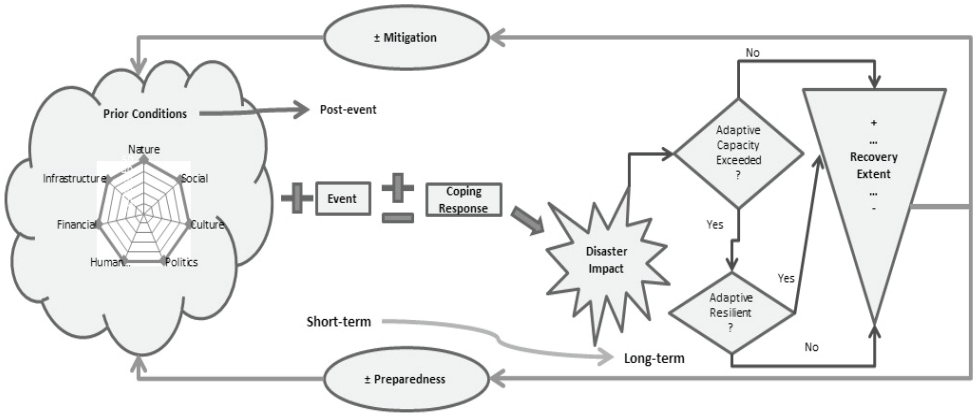

Figure 3. ***The proposed disaster resilience of place model.***

Table 1. ***Community resilience indicators for process and impact evalution.***

Indicator	Examples
Ecological	Wetlands acreage and loss, Erosion rates, % impervious surface, Biodiversity, number of coastal defense structures
Social	Demographics (age, race, class, gender, occupation), Social networks and social embeddedness, Community values-cohesion, Faith-based organizations
Economic	Employment, Value of property, Wealth generation, Municipal finance/revenues Institutional: Participation in hazard reduction programs (NFIP, Storm Ready), Hazard mitigation plans, Emergency services, Zoning and building standards, Emergency response plans, Interoperable communications, Continuity of operations plans
Infrastructure	Lifelines and critical infrastructure, Transportation network, Residential housing stock and age, Commercial and manufacturing establishments
Community Competence	Local understanding of risk, Counseling services, Absence of psychopathologies (alcohol, drug, spousal abuse), Health and wellness (low rates mental illness, stress-related outcomes), Quality of life (high satisfaction)

weather by engaging students and teachers in identifying risks, environmental factors, and other challenges through a curriculum that teaches about environment and safety.

DISCUSSION

Table 1 gives example community resilience indicators for process and impact evaluation. Teachers, local emergency workers, and local authorities are trained on the use of this SWEP plan and provide tools for conducting fieldwork with all students, including students with disabilities, who are the most vulnerable during a disaster. Coordination teams work in schools to establish a school safety committee in each school. Students in the committee participate in discovery-learning trips where they learn basic survival skills, identify and map hazards, discuss environmental issues and their impacts, as well as learn and identify safe routes for travel and evacuation, including those appropriate for children with disabilities. During these trips, they map the coordinates of various places, recording and documenting the information in picture and narrative form. Ultimately, the interactive approach will enable students in the most at-risk schools to develop and add additional layers in the map, showing environmental hot spots, hazards, and vulnerabilities the children discovered during the learning excursions. This plan will help students learn more about environmental protection and the natural hazards their communities are exposed to, resulting in resilient and ecological culture and behavior change. The information collected is shared with the wider community and used by local municipalities for planning purposes and in the case of emergencies.

CONCLUSIONS

This SWEP plan addresses specific issues pertaining to the local communities and includes culturally-appropriate educational messages. Most part of the educational intervention is based on natural and built environments in local communities and students will have a better understanding of learning, utilizing and preserving their environment. Implementing this plan will not only enable schools to have a disaster management plan in place, but will also engage the community in sustainability of the natural resources.

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Teachers' Professional Roles and Agencies in Curriculum Development and Implementation

Kaori I. Burkart

Abstract: This article focuses on the connection between curriculum development/implementation and teachers' professional development/learning. It reviews previous research focusing on the relationship between the two factors in order to expand knowledge about curriculum issues from teachers' perspectives. Exploration of the issues from teachers' perspectives will allow development of broader and more complex knowledge of contemporary educational challenges. The purpose of this paper is to explore curriculum development and understand current educational practice from teachers' perspectives. Teachers' social class and gender bias are discussed in the first half of the paper, followed by a report of professional development as a tool for curriculum implementation.

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Keywords: teacher professionalism, intensification, professional development

INTRODUCTION

What is an effective curriculum—effective for whom and in what context? The field of curriculum studies has been searching for answers to this fundamental question for more than a century. Contemporary society is more diverse than ever, with cultural, political, and economic backgrounds intricately entangled with educational practice. Although scholars and curriculum developers try to determine or identify "effective curriculum" it seems that the gap between theory and practice is considerably wide in post-modern society. In such a challenging educational environment, educators make great efforts to lead their students to learn. Those who are most closely connected to the students' educational journeys and curriculum development are classroom teachers. These teachers have the first-hand knowledge of instructional methods and experiences from working with their students on a daily basis. Without their assistance and effort, curriculum development in a practical sense will be ineffective and valuable curriculum reform will not be delivered to their students.

Although it is obvious that teachers play a crucial role in curriculum development and that they are the most qualified to evaluate curricula based on first-hand experience, their voices are rarely heard. They are, in fact, stuck in the "middle management position" that receives social and political blame from multiple directions. To close the gap between theory and practice in curriculum studies, it is important to understand the social and political contexts of teachers' roles and perspectives. The main purpose of this paper is, from teachers' perspectives, to explore the field curriculum development and understand current educational practices. The article approaches this topic from two perspectives: a) teachers' social class and position and b) professional development and implementation.

TEACHERS' SOCIAL CLASS AND POSITION

In this section, teachers' social class and position will be explored, examining their place in the current social structure. Apple (2009) discussed the fundamental issues that teachers are facing. Issues created via "proletarianization" (Apple, 2009, p. 199) of teachers' social class are closely related to challenges in curriculum development and implementation. The following will focus on teacher proletarianization based on social class, gender bias, and intensification in tasks and responsibilities.

Proletarianization in Class and Gender

No Child Left Behind (NCLB) has illustrated many of the problems of proletarianization issues. Gentry (2006) indicated that teachers have been strongly encouraged to teach what is tested for, leading to students' standardized testing results being considered a primary performance measure which in some instances may influence teacher compensation. In this type of environment, curriculum narrows to a one-size-fits-all education, with teacher creativity and educational leadership completely ignored. This ensures very little autonomy in teaching within contemporary school systems. Entire schools and school districts become desperate because test scores may determine whether they are eligible for receiving resources or vouchers. It is obvious that the current educational system is a result of a "politically charged, top-down, hostile take-over of America's schools" (Gentry, 2006). The current educational environment is challenging enough; common problems in the form of increased numbers of dropouts, cheating on tests, and other unreported issues are blamed on the teachers (Thrupp, 2009) instead of the actual cause: politics. The more politicians' power over curriculum increases, the less a teacher's input into the curriculum. This vicious cycle accelerates the proletarianization of teachers.

Apple's (2009) brief review of the history in the U.S. educational system illustrated that proletarianization resulted in a male-dominant leadership with an overwhelmingly female labor force (the actual number of teachers working at schools) which resulted in a lack of leadership while taking advantage of female stereotypical gender roles (e.g., nurturing and caring). Gender inequity in the field of education is clearly illustrated via U.S. Census (2012). For example, the number of female personnel (75%) working in the K-12 public school system is almost three times more than male personnel (25%). At the elementary school level, female classroom teachers are nearly 90% of the total number of teachers. Despite the overwhelming number of females in the teaching profession, at the administrator and policymaker level, including district officials, school principals, and assistant principals, there are no significant differences in the number of male and female personnel. Male administrators represent 10% of the total male teacher population, but female administrators represent only 4% of total female teacher population (Table 1). In other words, females are seriously underrepresented in administrative positions. It is impossible to discuss teachers' societal position without mentioning gender bias.

Proletarianization not only places teachers in a somewhat vague position between "petty bourgeoisie and the working class" (Apple, 2009, p. 199) but also restricts teachers from maintaining their positions with relative autonomy. It makes them vulnerable from a professional perspective. Despite their educational qualifications, a tremendous amount of pressure and responsibility drives them into a tight corner.

Intensification

Apple (2009) also believed that one of the elemental factors related to proletarianization is "intensification" (p. 204). Intensification in teaching practice occurs when the teachers' responsibilities become greater and/or more intense. Additional responsibilities vary from lunch duties to meeting all the requirements of teaching students within one-size-fits-all curricula. Intensification accelerates unreasonable expectations such as high standardized educational goals and overwhelming pressures and responsibilities, passing these burdens off as "professionalism" (Apple, 2009, p. 206). In addition to true professional responsibility (quality teaching), a number of unreasonable responsibilities (e.g., lunch and recess time duties) are piled on top of one another and serve to squash true professionalism. Intensification leads easily not only to teacher burnout but also to poor performance in the classroom (Ransford, Greenberg, Domitrovich, Small, & Jacobson, 2009). More than ever, teacher professional evaluation is based on student standardized test scores and extraneous teacher training loosely related to their immediate needs (Bourke, Lidstone, & Ryan, 2015). That is, quality teaching will be slowly encroached upon and diminished due to the overwhelming amount of additional tasks with which teachers become saddled.

Teachers' social class is located in a somewhat unique position and proletarianization leads to issues reflecting social class and gender inequity. Teachers are an easy target for assigning blame by politicians and society as a whole. In this challenging and demanding environment teachers are trying to play their roles with their best possible performance. After all, they are the curriculum transmitters and implementers for their students. Even if a "perfect" curriculum were to be developed in theory, it will not be delivered to the classroom without teachers. As Apple (2009) argued, intensification of the teachers' tasks makes curriculum development even more difficult and thus less effective. Successful curriculum development must be integrated with knowledge, skills, capabilities, and perceptions from the teaching profession. To enhance effectiveness of curriculum implementation, professional learning and development

is crucial. In order to teach effectively teachers must be kept up to date with current curriculum, pedagogy and strategies, educational technology, and overall classroom teaching practices. Darling-Hammond (2009), who served as a member of the Obama administration's educational policy transition team, strongly encouraged a move away from the inflexibility of the NCLB policy and insisted on maintaining dialogues in meaningful learning assessment and sufficient teacher professional development. One of the most direct influences improving teacher intensification is professional development, itself closely related to curriculum implementation.

PROFESSIONAL DEVELOPMENT AND CURRICULUM IMPLEMENTATION

With existing social and political issues and obstacles in the practice of teaching and developing effective curriculum, classroom teachers still try their best to implement curriculum theories in practice, monitor their students' academic progress, and foster cultural, social, and personal growth and development. Previous studies in curriculum reform and academic success demonstrate a strong correlation between teacher support and student engagement and connection to school (Klem & Connell, 2004). To ensure a constructive and supportive learning environment, teachers, in particular, have a great responsibility to demonstrate positive emotions in class to promote intrinsic motivation (Meyer & Turner, 2006). Thus professional development is one of the most crucial elements of successful curriculum development and implementation.

Professional Development

The importance of professional development has been discussed with the general conclusion that high-quality professional development helps students learn better (Desimone, 2009; Darling-Hammond & Richardson, 2009; Ransford et al., 2009; Rotherham and Willingham, 2009; Shawer, 2010). Professional development supports not only teachers learning contemporary educational trends including curriculum, policy, and teaching strategies and techniques but also benefit students thanks to more competent and well-prepared teachers. According to Ryan and Deci (2000), in self-determination theory, people were significantly influenced via social and contextual environments which were closely related to their intrinsic motivation, self-regulation, and well-being. People are likely to be more proactive and engaged when their three psychological needs (competence, autonomy, and relatedness) are satisfied or enhanced. Successful professional development, therefore, will serve as a powerful tool for teachers in satisfying their psychological needs by promoting intrinsic motivation and self-regulation and building positive and constructive interpersonal relationships with their students. Overall, positive perspectives in their teaching practice will aid in delivering curriculum more effectively and implementing it more successfully. As mentioned earlier, teachers are the first-hand curriculum implementers. Their proficiency in teaching and learning has a strong impact on their students' academic success. Shawer (2010) found a positive correlation among teacher curriculum adaptations, their professional development, and professional satisfaction. The results of the study demonstrated parallels with self-determination theory: professional development promotes professional skills and awareness of how curriculum should be implemented in the classroom. It can promote teacher self-efficacy and satisfaction, which in turn encourages autonomy in teaching practice. Likewise, students can benefit from better curriculum and instructional implementation. The more successful professional development is encouraged and implemented the more positive effects in the learning environment can be created. Such constructivist perspectives are an elemental approach to contemporary educational practice which provides both students and teachers opportunities to build positive learning environments that include higher motivation and self-efficacy (Pedersen & Williams, 2004). Effective professional development will support constructivist approaches (Kim, 2005; Palmer, 2005) and empower not only teachers but also students simultaneously (Voogt et al., 2011)

Darling-Hammond and Richardson (2009) argued that professional development programs should be regularly evaluated in terms of their content and context. Teachers need to learn to teach in ways that help students develop complex and analytical skills necessary in the 21st century. The contents of professional development programs should be closely related to the needs of individual schools. The authors indicated that professional development should be useful and practical, expanding not only teachers' knowledge of subject matter but also their teaching skills and techniques. Successful professional development programs can provide the teachers hands-on, active learning opportunities which enable them to support student-centered (constructivist) teaching models. Such productive experiences also encourage teachers to work collaboratively, promote wider interdisciplinary connections, and better interpersonal relationships among colleagues. In fact, the results of a study by Voogt et al. (2010) examining teacher learning trajectories concluded that collaborative

curriculum designs generated by teacher teams were most effective and had a strong influence on teacher satisfaction and self-confidence. As Ryan and Deci (2000) have stated, constructive experiences can promote intrinsic motivation, self-regulation, and well-being. These positive learning experiences can also cultivate a sense of belonging (Bandura, 1991) to one's professional environment. Thus, better implemented professional development can be a crucial element to teachers bringing about successful educational reform and curriculum development.

Desimone (2009) argued that improvement in the quality of teacher learning and professional development is one of the most critical elements for educational reform. This researcher identified professional development as enhancing teachers' knowledge and skills and providing opportunities to reflect on personal attitudes, behaviors, and beliefs in teaching practice. Effective professional development can provide teachers with improved critical thinking skills and professional agency, helping them become more aware and conscious of their surroundings and of contemporary educational issues (Kohli, Picower, Martines, & Ortiz, 2015). They will be more likely to consciously reconstruct their knowledge and skills when they connect new knowledge and skills with their own perceptions. This type of exercise will encourage them to improve the quality of their instruction and their instructional approach to pedagogy. According to Silin (2009), teachers are supposed to be the best supporting personnel, equipped with neutral and objective viewpoints for all learners in an educational environment. However, it is not easy to remove their "personal values, prejudices, and preconceptions" (Silin, 2009, p. 251). In this regard, teachers must recognize that they can be highly subjective. Acknowledgment of their personal bias and awareness of the controversial issues will help them prepare a more equal and collaborative curriculum for all learners. Thus, teachers' personal and professional development and instructional improvement will not only help teachers to become more conscious professional but also greatly benefit students' overall development. Although the advantage of strong and effective professional development is evident, current educational issues and challenges prevent the education system in the United States from attaining the best possible outcomes.

CHALLENGES IN EDUCATIONAL ENVIRONMENT

A fundamental but crucial challenge related to the discussion above is how to guarantee good quality and sufficient quantity of professional development programs. This challenge has to be addressed at the level of individual personnel related to the issue in order to affect change in the education system. Rotherham and Willingham (2009) proposed that successful professional development programs can be implemented only when three parties of professionals work in partnership: classroom teachers, school administrators, and policymakers. As illustrated in this article, researchers of curriculum studies and also related principles have argued that teachers need more robust and practical training and support systems and that true curriculum reform cannot be implemented without changes from administrators and policymakers.

In practice, teachers still struggle to teach under stringent expectations, often without the benefit of professional development and advocates of student-centered approach. Rotherham and Willingham (2009) argued that teachers receive insufficient professional development hours, opportunities, and content. Their daily tasks and responsibilities have become more intensified than ever before due to the testing-standards movements. Accordingly, societal demands from the multiple directions (e.g., students, parents, school administrators, communities, and districts) are severe. Even though the Class Size Reduction (CSR) policy (Burch, Theoharis, & Rauscher, 2010) is suggested as a solution to some current issues, teaching styles and strategies are not modified to accommodate a student-centered approach. It is supposed that this is because of a variety of issues, all of which must be juggled by a classroom teacher whose tasks have become significantly intensified (Apple, 2009). Until a certain quantity and quality of professional development is secured for individual teachers, challenges in the curriculum implementation will remain the status quo (Darling-Hammond & Richardson, 2009).

Legault, Pelletier, & Green-Demers (2006) indicated that students perceive their teachers as educational leaders who create learning structures and disseminate new academic information. Students see their teachers as academic professionals who can enhance and support their academic abilities effectively. Effective instructional interactions build constructive learning experiences that positively motivate both students and teachers (Meyer & Turner, 2006). Such constructivist perspectives can often provide both students and teachers opportunities to build positive learning environments (Kim, 2005). Therefore, teachers are responsible for keeping up with teaching skills and techniques in order to meet students' expectations and support their academic success. As Apple (2009) indicated, the significant gap between

expectations towards teachers and proletarianization as a social phenomenon makes the challenges even harder to manage at the individual-teacher level.

Gender inequity in the teaching profession is cultivated early on in people's educational journeys. The American Association of University Women (2009) indicated that school environment played a significant role in transmitting not only intellectual matters but also biased messages and images such as gender stereotyping. For example, traditional curricula have little to do with women and racial/ethnic minorities. Classroom learning activities were inclined more toward boys' interests. Achievement expectations were set differently for male and female students; unsurprisingly this was also true for minority students. It is crucial to construct more balanced and inclusive curricula by becoming more conscious of gender difference and the existing bias and negativity reflected in school environments. Many current challenges in the teaching profession are deeply rooted in gender inequity issues and teachers' proletarianization.

DISCUSSION

To bring about more effective curriculum implementation, researchers have provided many practical applications and suggestions. For example, Rotherham and Willingham (2009) indicated that advanced instructional techniques and methods require teachers to be highly knowledgeable in a wide variety of range of topics and skillful in making "in-the-moment decisions" (p. 19) corresponding with progress in the lesson plan. The content and context of professional development programs should be always evaluated. To ensure the effectiveness of existing professional development, content should be connected to a school reform, linking specifically to teaching and learning. If the professional learning opportunities are the one-shot workshop model or are episodic and fragmented, they are usually not effective (Darling-Hammond & Richardson, 2009). Thus professional development programs should be closely monitored and modified depending on the present curriculum needs in the specific context of each school. In other words, professional development programs should be carefully developed and articulated to be more effective. Such modification should be managed mostly at the school administrator level. This means that school administrators are responsible for monitoring the current educational environment and supporting teachers' learning opportunities and professional development programs on a regular basis to facilitate curriculum implementation.

Ransford et al. (2009) indicated a correlation between curriculum implementation and support and teachers' perceptions of burnout and self-efficacy. The results of the study showed that teachers' self-efficacy level was positively correlated with the amount of curriculum implementation support, such as offering quality professional development programs and ensuring a quantity of hours to attend such programs. The teachers who perceived their school administration as more supportive indicated higher implementation quality. On the other hand, teachers who perceived the high-level of adverse psychological experiences, such as burnout, indicated negative perceptions of curriculum support and quality. According to Deci and Ryan (2000) connectedness is also a key element of psychological needs. If there is a significant deficit, teachers' emotional and psychological security will not be able to keep their equilibrium. Martin and Dowson (2009) argued that such emotional and psychological security can better enable people to "take on challenges, set positive goals, and establish high expectations that extend and motivate them" (p. 335).

Furthermore, Darling-Hammond and Richard (2009) suggested that building professional learning communities is beneficial for teachers; a robust support system among the teaching professional will serve as an excellent resource. Professional learning communities allow teachers to share and collaborate with others with similar objectives in their professional lives – effective teaching and learning. This will help teachers to construct positive relationships among colleagues and achieve higher goals.

In addition, constructive partnerships and learning communities need not be useful only for classroom teachers. Any level of educational administrator should be counted as a potential part of a professional learning community. Building positive and supportive relationships between administrators and classroom teachers will help foster a better understanding of the gap between theoretical policies and practices. When effective communication and interpersonal relationships are established, administrators will be able to understand classroom issues and teachers' struggles more clearly. They then should be able to implement more robust educational reform. This constructive and cooperative association will enable decision makers to develop more realistic and robust curricula, to create practical professional development programs, and to monitor and modify what classroom teachers need and how they can be supported. The teachers who perceive positive and supportive support from administrators make more conscientious efforts while implementing new curricula (Ransford et al., 2009).

CONCLUSION

In conclusion, it appears that teachers' unique social class and gender stereotypes have a significant influence in curriculum development and implementation. Teachers' proletarianization makes their social status more vulnerable and gender bias loads them with an unreasonable amount of tasks and responsibilities which Apple (2009) calls intensification.

One of the only tools that may support teachers is an effective and robust professional development and support system. Robust programs and opportunities, in terms of both quality and quantity, in professional learning should be guaranteed to teachers across all levels of experience. To ensure more effective learning experiences, classroom teachers and administrators must work collaboratively to build a constructive and mutually beneficial support system. Nichols and Parsons (2011) reflect John Dewey's educational philosophy and stress that teachers are one of the primary stakeholders who should be empowered to improve current educational environments.

Teachers, as curriculum professionals, should be consulted about its evaluation because they are ultimately responsible for translating its objectives into specific lessons. They are also the primary source for first-hand knowledge and experience in the classroom, interacting with their students. As professional educators, teachers are always responsible for monitoring how the students are learning and should be routinely assessing their progress. An appropriate curriculum would provide teachers a realistic set of goals and techniques to assist student learning at all ability levels. When decisions about curriculum changes are made, teachers should be able to evaluate the practicality and validity and provide feedback based on their direct interaction with students. These sorts of proposals will be engaged more successfully when strong partnerships between classroom teachers and administrators are constructed. Both groups should be aware of their professional responsibilities for creating and implementing more effective, valuable, and reasonable curriculum for students. Encouraging better communication and interpersonal relationships will promote professional development of both high-quality and sufficient quantity, something sorely needed for effective teaching and learning. Collaboration is the key to improving the American education system and practices, and should benefit not only students and teachers but also the society in which they exist.

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Structuring Writing Interventions through Strategy Instruction: Three Teacher Candidate Case Studies

Brooks R. Vostal

Abstract: Teacher educators must prepare special education teacher candidates to generalize data-based decision making skills to field placements. There is no "one size fits all" instruction for special education teacher; in fact, the individualized nature of intervention makes generalization a special challenge for candidates. Three special education teacher candidates used DESCRIBE IT, a mnemonic strategy for data-based individualization, to design interventions for adolescents with literacy-related learning disabilities. Each candidate's intervention is presented to illustrate the versatility of DESCRIBE IT as a method of structuring intervention design and the way in which use of a heuristic can serve as a much-needed constant in a fluid instructional environment. Findings are discussed in terms of successes and challenges candidates experienced during specific interventions. Implications of using heuristics to promote generalization and adaptability of teachers' data-based decision making skills to field placements are discussed.

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INTRODUCTION

Reform efforts in teacher preparation assume that teacher quality is the most important factor in student achievement (Cochran-Smith, Piazza, & Power, 2012). High-quality teacher candidates are able to enact content-specific domain expertise, demonstrate the impact of that instruction on measures of student achievement, and make decisions about what and how to teach in the future (McHall, McHatton, & Shealey, 2014). This process of data-based decision making represents a common principle across professional teacher standards (Fuchs, Fahsl, & James, 2014). An example of its prominence in current teacher reform efforts can be found in the Teacher Performance Assessment (edTPA), created by the Stanford Center for Assessment, Learning, and Equity (SCALE, 2013), which requires teacher candidates to document how they use formative assessments to monitor students' progress as a guide to the instructional decisions they make across lessons. One way teacher educators can promote candidates' acquisition of data-based decision making skills is to emphasize research-based principles of instruction (Greenwood & Maheady, 2001), serving as a link between educational research and the daily experience of teaching (Cook, Landrum, Tankersley, & Kaufman, 2003), while giving candidates practice making instructional decisions from data throughout their university-based coursework (Mokhtari, Rosemary, & Edwards, 2008; Skalski & Romero, 2011). Nevertheless, teacher educators must also structure candidates' generalization of these data-based decision making skills into actual practice in schools in order to have any real effect on teacher candidates' quality (Scheeler, 2008; Scheeler, Bruno, Grubb, & Sweeney, 2009). This may help ensure teachers are able to adapt skills they've acquired during their pre-service preparation to the varied instructional demands they'll face as intervention specialists.

High-quality special education teacher candidates (SETC) must acquire skills in a variety of areas to demonstrate their quality in inclusive settings (e.g., academic instruction, behavior management, teacher collaboration; Gerhke & McCoy, 2012; McHale et al., 2014). Both teachers' self-report questionnaires (e.g., Conderman & Katsiyannis, 2002; Kersaint, Lewis, Potter,

& Meisels, 2007) and observational inventories (Vannest & Parker, 2010) have shown that special education teachers' time use–and therefore the focus of their daily work–varies considerably across teachers' specific instructional settings. Across all variation, however, the foundation of special education teaching remains the individualized nature of interventions defined within students' Individualized Educational Program (IEP; Shriner et al., 2012). In IEPs, *substantive requirements,* those that should result in meaningful educational benefit for students with disabilities, focus on assuring that individual students' progress can be monitored through specific goals and objectives (Bateman & Linden, 2006; Christle & Yell, 2010), which, in turn, must be linked to specially designed interventions. This process of linking interventions and progress-monitoring has recently been referred to as *data-based individualization* (DBI; National Center on Intensive Intervention, 2013), where teachers deliver intensive interventions targeting specific skills while also supporting students' participation in core instruction (i.e., general education curriculum). Therefore, SETCs must be prepared to *both* design intensive interventions across a variety of academic and behavioral domains and support students' access to general education inclusive settings.

To increase the likelihood that SETC's university-based preparation generalizes to field experiences, Scheeler (2008) identified factors that can be incorporated into teacher education programs. For example, (a) providing immediate feedback during the acquisition of new teaching skills; (b) training new skills to mastery; and (c) programming university-based instruction for generalization all show promise for increasing the likelihood that SETCs will use what they have been taught when they are teaching in the field. In order to program university-based instruction for generalization, one method teacher educators may employ is to develop lessons around *strategies*, mediating tools that candidates can readily use across contexts or situations (Burns et al., 2013; Stokes & Baer, 1978).

STRATEGY INSTRUCTION

In the field of special education, cognitive strategy instruction has a long history of showing K-12 students how to take control of their own learning, thus mediating their generalization of acquired skills to new tasks (Hughes, 2011; Reid & Lienemann, 2006; Schumaker & Deshler, 2006). Strategies provide heuristics to guide learners as they tackle complex problems (Rosenshine, 1995). Luke (2006) notes that strategies promote (a) *cognitive processes*, observable activities of applying the strategy (i.e., following the steps needed to complete a task); and (b) *metacognitive processes*, self-regulatory decisions made in applying the strategy (e.g., deciding which strategy is appropriate to use in a given situation, monitoring the strategy's effectiveness, evaluating whether the product developed during use of the strategy was satisfactory). Hughes (2011) explained that task-specific strategies include both content and design features that help to make it more likely that students use strategies effectively. *Content features* of strategies include sequential steps that cue students to use specific cognitive and metacognitive skills, as well as to take overt actions at each step. *Design features* of strategies include first-letter mnemonics to structure the steps in sequence, described in as few words as possible, while beginning with a verb to cue the actual behaviors that lead to successful task completion (i.e., detailed description of steps is provided during instruction, not in the mnemonic). Within special education teacher education, authors have discussed the promise of strategy instruction as a framework that can guide teacher candidates across professional practices (e.g., Friend & Bursuck, 2013, INCLUDE; Hughes, 2011, STRATEGY; McNaughton & Vostal, 2010, LAFF Don't CRY).

STRUCTURING INTERVENTION DESIGN: DESCRIBE IT

One method of preparing SETCs to design interventions is through the DESCRIBE IT strategy (Vostal, Messenheimer, & Hampton, 2013). This first-letter mnemonic strategy guides SETCs through a series of actions necessary for data-based decision making when delivering intensive interventions; these steps have been shown to align with tasks candidates must complete in teacher performance assessments (Vostal, Messenheimer, Hampton, & Keyes, 2014). The first step is *Define a target*, which prompts candidates to examine screening tools to determine student skills in need of intervention (Lembke, Hampton, & Beyers, 2012; Riccomini & Witzel, 2010). Next, candidates *Elect a reliable measure* and administer that measure (e.g., curriculum based measurement [CBM] probes) in order to *Summarize the baseline* data on a graph. This graph is used to *Calibrate the goal*, where candidates connect the baseline median score (Stecker, Fuchs, & Fuchs, 2008) with a goal that represents published year-end benchmarks (e.g., typical scores that represent a likely non-risk status in reading proficiency at that grade level) or normative growth rates (i.e., typical and ambitious weekly rates of improvement for students by grade level).

Based on the initial assessment results for the targeted

skill, candidates next *Recommend a research-based intervention* that specifically addresses the skill they targeted earlier. This step requires candidates to review the professional literature they have been exposed to during their preparation and choose among the many possibilities in a way that fits within their specific context. Next, the strategy prompts candidates to *Implement with fidelity*, recognizing that implementation fidelity data may be just as important as outcome data when evaluating an intervention's effects (Musti-Rao, Hawkins, & Tan, 2011). As candidates deliver the intervention, the strategy reminds them to *Begin progress monitoring* over three to six weeks (Lembke et al., 2012; Stecker et al., 2008), with probes administered at least weekly (Lembke, McMaster, & Stecker, 2010). These progress monitoring data are graphed on the same graph as the calibrated goal, which allows candidates to *Evaluate effectiveness* of the intervention using *data point analysis,* where four consecutive data points above or below the goal line indicate that an instructional change needs to be made (Hosp et al., 2007). In DESCRIBE IT, whatever evaluation is made about the students' progress (i.e., satisfactory or unsatisfactory progress) candidates next *Intensify instruction.* Candidates may incorporate generalization and maintenance procedures when data indicate the student is progressing satisfactorily toward the goal or add elements to the intervention to enhance skill acquisition when data indicate the student is not progressing satisfactorily. Finally, after these intensifications have been implemented, DESCRIBE IT prompts candidates to *Talk to the team* so that there is accountability for intervention effectiveness and so that their work can fit within the multi-tiered systems of supports used in many schools (Lane, Menzies, Ennis, & Bezdek, 2013).

In our special education teacher preparation program, we teach DESCRIBE IT in the senior methods block, the semester immediately before student teaching. Candidates take courses in teaching literacy, teaching mathematics, conducting assessment, and developing an IEP, along with an eight-week, full time practicum. Across courses, we introduce background knowledge for each step in DESCRIBE IT, as well as provide initial, guided practice in its use. Candidates are expected to generalize skills for data-based decision-making and intervention design taught in these university-based classes to their work with a student during their practicum field experience. Additionally, candidates can follow the steps of DESCRIBE IT as they design interventions that are submitted for their performance assessment during student teaching.

PURPOSE AND METHODOLOGY

The next portion of this article will present three case studies in which SETCs used the DESCRIBE IT strategy to structure interventions in their field experiences. Case studies allow for in-depth examination of phenomena in real-world contexts (Yin, 2012). In each case, candidates developed literacy interventions for high school students identified with learning disabilities; the students' educational testing indicated achievement at elementary grade equivalency in the specific areas targeted for intervention. And while these are presented as three discrete case studies, it is important to note that they serve to illustrate the flexibility of the DESCRIBE IT strategy. Teachers must individualize interventions, even when they're all for students with similar disabilities, in the same subject area. The SETCs described in these case studies were three females earning their initial license as special education teachers for students with mild/moderate educational needs and had successfully completed university-based coursework related to literacy instruction (i.e., courses on phonics, content literacy, literacy assessment, and literacy intervention). Following procedures outlined by the Institutional Review Board at the university where this study was conducted, all participants signed informed consent to have their work in these interventions examined for research purposes. Data sources included the intervention lesson plans, corresponding videos of instruction, progress monitoring probes and graphs, and written commentaries in which candidates documented and reflected on all decisions made throughout the process.

CASE STUDY 1: Spelling Intervention

Instructional Context

Dakota was assigned to a field experience in which she was primarily responsible for students in grades 9 and 10 in an urban high school. Her instructional day was split between academic assistance delivered in a resource room setting and one period of collaborative teaching in an inclusive mathematics class. The intervention she developed was for a female, African-American, 9th grader who was identified under the category of specific learning disabilities. This student was involved in a systematic direct instruction reading intervention program (i.e., Corrective Reading), but Dakota's cooperating teacher assigned Dakota to develop an intervention that would address the student's writing goals, which indicated that the student was writing significantly below grade level.

Intervention Design and Decisions

To *Define a target*, Dakota reviewed the student's IEP, most recent educational testing report (ETR), and previous work samples. Across all of these documents, Dakota identified spelling as a particular weakness; therefore, she targeted spelling in the intervention. Next, Dakota *Elected the reliable measure* of AIMSWeb Spelling-CBM at the grade 6 level; this matched the grade equivalent the student achieved on a recent standardized test noted in the ETR. In the Spelling-CBM, a teacher dictates a list of words to the student every 7 seconds for two minutes (Shinn & Shinn, 2002). Dakota's initial identification of AIMSWeb probes concerned her cooperating teacher, who was more accustomed to weekly mastery tests. The cooperating teacher had used AIMSWeb for reading fluency progress monitoring, so Dakota's explanation for using the spelling outcome measure in a similar way eased the cooperating teacher's concerns. To *Summarize the baseline*, Dakota first administered three probes in a single session and plotted the resulting correct letter sequences (CLS) on a graph (i.e., 84, 90, 94 CLS). To *Calibrate the goal*, Dakota used the median CLS of 90 and calculated a growth rate of .65 CLS per week, an ambitious level of spelling growth per week listed in published guides on CBM (i.e., Hosp, Hosp, & Howell, 2007), leading to a goal at the end of eight weeks of 96 CLS.

Dakota *Recommended a research-based intervention* focused on teaching common spelling rules (Sayeski, 2011), following explicit instruction for academic rules guidelines described by Archer and Hughes (2011). In order to document that she was able to *Implement with fidelity*, Dakota used a checklist of key instructional components (e.g., modelling of the rule, fading prompts as she and the student applied the rule together, and checking that the student could accurately apply the rule on her own), as well as video recording of one of her lessons. Using the measure she had elected earlier, Dakota *Began progress monitoring* once a week, in addition to conducting mastery tests of words that followed the rules that had been taught. The progress monitoring probes, however, were Dakota's focus when she *Evaluated effectiveness* based on comparing probe data against the calibrated goal line. Data revealed that her student was making progress on the probes at the expected rate. That is, her students' probe data hovered above or below the goal line, but never in the same pattern for four consecutive probes. Because her evaluation suggested that the intervention was proving to be successful, the way she chose to *Intensify instruction* was to program for generalization through applying the spelling rules across subject area writing that her student was completing. Dakota included a "spell check" session after practicing with the spelling rules in which her student reviewed all assignments she was completing to identify places where she either did or needed to use one of the spelling rules. Finally, Dakota *Talked to the team*, in this case her cooperating teacher and university mentor, to show the progress that had been made and discuss options for how the student might continue to work on spelling in the future. Ultimately, the cooperating teacher indicated that she could see how more of her students would need this spelling intervention, and that she would consider expanding it to other students in the resource room.

Discussion

For Dakota, use of the DESCRIBE IT strategy led to a successful intervention. Her case highlights two important strengths stemming from the use of DESCRIBE IT. First, the fact that DESCRIBE IT requires candidates to *Elect a reliable measure* generally precludes teacher-made assessments that may not represent the underlying skill and do not have technical adequacy data to support their use for decision-making. It is possible that cooperating teachers who have years of experience in their particular schools may not use CBM across all areas, even if they do have experience using it for certain outcomes (e.g., oral reading fluency). Following DESCRIBE IT helps to ensure that candidates extend their use of CBM beyond what their cooperating teachers may do, thus generalizing the university-based knowledge candidates' acquired in valid assessment practices for special education.

Second, in order to *Recommend a research-based intervention*, Dakota combined a research-based content recommendation (i.e., ten common spelling rules; Sayeski, 2011) with research-based procedural recommendations (i.e., explicit instruction in academic rules; Archer & Hughes, 2011). This combination exemplifies how DESCRIBE IT's step to *Recommend a research-based intervention* can allow SETCs to respond to their particular field experience context, while generalizing the content learned across their university-based classes. The school in which Dakota taught did not require a specific spelling curriculum, but DESCRIBE IT encouraged Dakota to re-visit the principles she had learned and the practitioner-oriented journal articles she had read during her program in order to design an intervention that met her particular student's needs.

CASE STUDY 2: Revision Intervention Instructional Context

Abby was assigned to a field experience in which her day was split between responsibility for small group instruction to high school students in a resource room and collaborating with English/Language Arts teachers in inclusive classes at an urban high school. The intervention Abby developed was for a male, European-American, 10th grader who was identified under the category of specific learning disabilities. This student was in the resource room only once a day (i.e., 2nd period), but Abby was also present in his English/Language Arts class in the afternoon. Abby's cooperating teacher indicated that there were writing goals on his IEP, and that she did not have sufficient data on whether he was making progress. She asked Abby to focus on writing.

Intervention Design and Decisions

In order to *Define a Target*, Abby reviewed the student's ETR (which had just been completed after a three-year cycle), and discussed options with the English/Language Arts teacher and her special education cooperating teacher. The ETR indicated that his "Spontaneous Writing Quotient" was below average for his age, and that he struggled to use correct sentence structure and punctuation. The English/Language Arts teacher concurred, indicating that capitalization was especially problematic for the student. Ultimately, Abby targeted editing skills observable through capitalization, punctuation, and spelling. She *Elected a reliable measure* in the AIMSWeb Written Expression CBM, focusing on the correct writing sequences (CWS) measure. In Written Expression CBM, students are provided a story starter and then given a set amount of time to write (i.e., 3 minutes for elementary grades, 7 minutes for secondary grades). For baseline, Abby had her student complete three probes across three consecutive days and *Summarized the baseline* data (i.e., 43, 47, and 35 CWS) on a graph. Using the median, she *Calibrated a goal* by drawing a line between 43 CWS and 51, the spring 50th percentile norm for AIMSWeb CWS for students in Grade 6 (i.e., the grade equivalent identified in the student's ETR; Hosp et al., 2007).

Abby *Recommended a research-based intervention* focused on teaching editing skills represented in the first-letter mnemonic COPS, which she had learned through the IRIS Case Study Unit on Written Expression (Leineman, Reid, & The IRIS Center, 2009). In each letter in COPS students are instructed to review their writing for different surface-level features: C stands for capitalization, O for organization, P for punctuation, and S for spelling. In the IRIS Unit, authors note that COPS is embedded within the WRITER strategy, and that it can be taught using the Self-Regulated Strategy Development (SRSD) framework. In order to show that she *Implemented with fidelity*, Abby created scripts of her lessons across the SRSD stages and video recorded one lesson. As she *Began progress monitoring*, Abby gave prompts from the AIMSWeb CBM in written expression once a week, counting CWS. She plotted these on the graph with her calibrated goal and *Evaluated effectiveness* by comparing her student's data to the goal line. These data showed that her student was not making progress as expected across the first three weeks of intervention. By week four, she knew she needed to make a change and *Intensify instruction*. For this intensification, Abby reviewed the progress monitoring probes and observed that while her student had started to use capitals and punctuation more appropriately, the strategy did not appear to make an impact on his spelling. She hypothesized that her student needed additional work only on spelling in order to apply the strategy; therefore, she modified her instruction to include explicit instruction in spelling each session before she would continue to practice applying the revision intervention. She continued this intensified intervention and progress monitoring using the same CBM probes she had elected earlier for another three weeks (i.e., three progress monitoring data points). In the final week of her eight-week field experience, Abby *Talked to her team* about the intervention and data she had collected. Data still showed that her student was not making progress at the level of her goal line. She showed the progress monitoring probes to her cooperating teacher and university mentor, who both agreed with Abby's conclusion that spelling was the particular weakness her student experienced. The university mentor noted that the revision strategy may not have shown much impact since the CBM probes did not necessarily give the student the opportunity to proofread and revise. She asked to look at the revision practice that was part of the lessons themselves. These showed that the student identified his spelling errors inconsistently. The cooperating teacher indicated that since use of spell-check was an accommodation the student had on his IEP, he ultimately would not focus on a specific spelling intervention; his focus needed to stay on helping the student earn credits and prepare for the state tests that the student still needed to pass.

Discussion

For Abby, use of the DESCRIBE IT strategy did not lead to a successful intervention, but Abby's case highlights both strengths and challenges of using the process

represented by DESCRIBE IT. One important strength was that the documentation prompted by strategy-steps allowed Abby to lead a purposeful, data-based meeting with her team. She was able to demonstrate what she had originally planned and implemented for her student, and then show the data she used to inform her decision to intensify the intervention. The documentation prompted by DESCRIBE IT helped to ensure that Abby was not making hasty instructional judgements, but instead maintaining a scientist-practitioner orientation in which she remained patient, persistent, and tolerant of ambiguity (Fuchs, Fuchs, & Compton, 2012) as she delivered the intervention.

Abby's experience with DESCRIBE IT also illustrates challenges that candidates experience when using the strategy. First, in her effort to both *Elect a reliable measure* and *Recommend a research-based intervention*, it is possible that Abby did not recommend an intervention that was most likely to promote progress on the measure she elected. While Abby's election of the specific CWS measure seemed appropriate based on available evidence suggesting that this more complex measure of accuracy is appropriate for secondary students (e.g., Amato & Watkins, 2011), it is possible that there was a mismatch between the strategy that prompts a student to review his written material for errors and an assessment that includes a timed writing opportunity. Abby's challenge in this case demonstrates a challenge that is likely to be common as candidates try to generalize university-based knowledge to their field placements. That is, when valid, research-based "pieces" of the intervention design process do not fit neatly together (i.e., assessments and specific intervention procedures), candidates are forced to combine pieces that they know as best they can in their field placements. DESCRIBE IT may mitigate some of this drift between the evidence-base and teachers' practice, anchoring them to a process that encourages candidates' to build interventions from the research.

CASE STUDY 3: Summarization Intervention Instructional Context

Jennifer was assigned to a field experience in which she was responsible for students across grades 10 through 12 in a rural high school. She taught these students in a resource room; her responsibilities did not include any co-teaching. The intervention Jenifer developed was for a female, European-American, 10th grader who was identified under the category of specific learning disabilities. Jennifer's cooperating teacher was the official "instructor or record" for the English Language Arts class in which this student and five others were enrolled. While this course often included whole-group readings and activities in preparation for the state testing, much of the time was devoted to individualized work on students' specific IEP goals.

Intervention Design and Decisions

To *Define a target*, Jennifer observed the student during whole-group instruction and reviewed her most recent IEP goals, and she determined that the target would focus on improved reading comprehension. Jennifer *Elected the reliable measure* of Daze (Good & Kaminski, 2011), the Dynamic Indicators of Basic Early Literacy Skills (DIBELS Next) version of a maze procedure. In the DAZE, students read a passage in which every seventh word has been omitted; they select the most appropriate replacement from three choices. Students have three-minutes to complete as many maze options as possible. Educational testing data included with the student's IEP indicated that her reading comprehension had been measured at the 4th grade equivalency; therefore Jennifer used 4th grade probes and administered three probes on consecutive days in order to *Summarize the baseline* on a graph. Baseline scores were 10, 13, and 14. Using the median of these scores and information from the benchmark goals in the DIBELS Next Assessment Manual (Good & Kaminski, 2011), Jennifer *Calibrated a goal* of 16 across the time she would deliver the intervention. On her graph, she drew a goal line between the median and her goal.

Jennifer *Recommended the research-based intervention* TRAP (Mason, Reid, & Hagaman, 2011), a variation of the Summarization strategy (Schumacher, Denton, & Deshler, 1984) that can be taught using SRSD stages. In TRAP, students are taught to *Think* about the topic in the passage before they read, *Read* a paragraph, *Ask* themselves what the paragraph is mostly about, and *Paraphrase* the important information. Mason and colleagues (2011) published lesson plans for teaching TRAP, and Jennifer used checklists based on these plans and video recordings of her instruction in order to document that she *Implemented with fidelity*. While the intervention was in place, Jennifer *Began progress monitoring* with weekly probes from the Daze. Data from these probes alternated above and below the goal line, so Jennifer *Evaluated effectiveness* of the intervention to be successful because there were never more than two data points below the goal line in a row. Because the data hovered above or below the goal line, maintaining an increasing trend, Jennifer *Intensified instruction* only through incorporating different content area readings into continued practice with TRAP in order to promote generalization. At the end of her field

placement, Jennifer *Talked to her team* to discuss next steps. Jennifer shared the data and explained each step in the intervention design. Jennifer's cooperating teacher had previously been unaware of SRSD or strategies such as TRAP, and was interested in expanding this instruction to other students in the class who also struggled with reading comprehension, but she was not interested in continuing the use of Daze. She wanted to measure students' reading comprehension with questions that would more closely resemble the types of questions that would be found on state tests.

Discussion

For Jennifer, use of the DESCRIBE IT strategy led to successful intervention development. Her case highlights both strengths and challenges of generalizing practices to field experiences. The primary strength represented in this case was Jennifer's choice to promote generalization by using TRAP with content area reading beyond what she had initially included in the intervention. The DESCRIBE IT strategy prompts candidates to *Intensify instruction* in different ways depending on whether data suggest the intervention was successful. Because data from Jennifer's student indicated that the intervention was going as planned, she did not make any drastic changes. Rather, the intensification emphasized using the skills her student had acquired in new contexts. Another strength illustrated by Jennifer's experience was in her cooperating teachers interest in continuing to build on the strategy instruction that Jennifer modelled. Because DESCRIBE IT prompts candidates to review professional literature in order to *Recommend a research-based intervention*, it creates an opportunity to expand the use of such practices in schools.

Jennifer's experience with DESCRIBE IT also illustrates a challenge candidates face as they generalize practices to field placements. Jennifer's cooperating teacher allowed Jennifer to use the Daze to monitor the intervention, but was not interested in doing so herself. Some experienced teachers have learned to be wary of unfamiliar assessment tools (Flowers & Carpenter, 2009), and in this particular case, even evidence of its use in monitoring students' progress was not sufficient to overcome this wariness. When candidates see this sort of resistance to the tools they learn to use during their university-based preparation, it has the potential to dissuade their generalization of many practices they have learned. In Jennifer's situation, however, the cooperating teacher's interest in the strategy instruction seemed to mitigate Jennifer's disappointment with the refusal to continue to monitor progress with CBM.

IMPLICATIONS

While the case study nature of the findings presented above suggests obvious limitations because we cannot assume that the candidates' experiences using DESCRIBE IT would be similar for all SETCs, they do suggest implications as candidates learn to design intensive interventions, as well as for teacher educators who want to design university-based experiences that generalize to field placements. The three case studies illustrated SETCs' use of DESCRIBE IT–a strategy that was specifically taught during university-based coursework and designed to help candidates mediate all of the skills related to data-based decision making they had learned–to structure literacy interventions during their field experiences. In each case, the candidate developed an individualized literacy intervention for a high school student identified with learning disabilities.

The versatility of DESCRIBE IT shown across these three case studies emphasizes an important benefit to the use of the heuristic provided by DESCRIBE IT for special education teacher educators, whose teaching responsibilities in schools have been shown to present significant variability (Conderman & Katsiyannis, 2002; Kersaint, Lewis, Potter, & Meisels, 2007; Vannest & Parker, 2010). Because of this variability, teacher educators cannot simply prepare SETCs for "standard" field placements. Rather, SETCs need to develop initial expertise in individualization, particularly as it relates to data-based decision making for IEP goals and objectives, that can be applied in a variety of different settings. If university-based preparation ensures that SETCs acquire these individualized data-based decision making skills, but also utilizes strategies such as DESCRIBE IT to mediate generalization of those skills to field experiences, teacher educators may best prepare SETCs to demonstrate their quality across instructional settings. It is important to note that DESCRIBE IT is not tied to any specific interventions; rather, it emphasizes that whichever interventions candidates recommend stem from the research base. The heuristic prompts SETCs to use and review the resources that they first experienced during university-based instruction as they teach in their field experiences. In this way, DESCRIBE IT remains the constant in a necessarily fluid instructional environment. Further, if teacher repeatedly implement the steps of DESCRIBE IT they may develop an instructional fluency with the process of data-based decision making that will help them manage the complex cycle of intervention.

The heuristic provided by DESCRIBE IT seemed to facilitate the SETCs generalization of skills to the field experiences. When initially acquiring data-based

decision making skills in university-based classrooms, SETCs can be provided immediate feedback from their university-based instructors. In field experiences, however, SETCs may not have easy access to faculty who can help design intensive interventions and interpret those data. Following DESCRIBE IT ensures that SETCs have the necessary data to make justifiable intervention decisions in accordance with procedural and substantive requirements of IEPs. In this way, the structure imposed by DESCRIBE IT mediates generalization of practices SETCs learned *as* students to their work *with* students. In addition, the *process* emphasized in DESCRIBE IT can help SETCs reflect on their instruction. Because the strategy requires that an intervention be conducted over time, it can prompt SETCs to reconsider the specific aspects of their instruction that are delineated by each step in the strategy, as opposed to viewing their teaching as simply successful or failed. The progress monitoring data that SETCs examine can show student improvements, even if those improvements are insufficient to be demonstrated on a single post-test "snapshot," because the data represent repeated measurement across weeks of intervention. If, for example, SETCs note during the *Evaluate effectiveness* step that the student is not making the amount of progress expected, they have data to guide their reflection about how to change the intervention because they can "see" in the graph whether and how the student made any progress at all. This, in turn, may alleviate some possible frustrations that SETCs could experience when and if an intervention is not successful. The heuristic provided by the DESCRIBE IT strategy allows SETCs to remain grounded in their instructional process–and therefore patient, persistent, and tolerant of ambiguity that data may show as students with disabilities acquire academic skills (Fuchs et al., 2012)–which, in turn, could help to promote SETCs' generalization of skills into the field.

Ultimately, preparation that ensures that candidates generalize university-based content to their field experiences is the goal of teacher education (Scheeler, 2008). In special education, in part because candidates may be placed in such a variety of instructional settings (e.g., Vannest & Parker, 2010), and with such a variety of instructional needs within each setting, teacher educators may choose to program university-based instruction around versatile heuristics that candidates can apply across settings. DESCRIBE IT represents one example of this sort of instruction, one which other teacher educators may choose to adapt and build from in order to promote candidates' generalization of skills that will best demonstrate teacher quality.

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Teaching mathematics through literature: Pre-service teachers' instructional planning and content integration

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Abstract: This paper reports data from a study exploring teacher candidates' instructional planning and integration of mathematics and literature. Situated within an elementary mathematics methods course, this study analyzes the ways in which teacher candidates utilize children's literature to teach mathematical content. These data presented here suggest that while teacher candidates employ children's literature to teach mathematics in a variety of ways, they still rely on a limited range of mathematics content focus on a tight range of grade levels. These findings provide direction for teacher educators in offering more effective support to candidates in integrating mathematics and literature.

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Keywords: integration, children's literature, mathematics, teacher candidates, elementary school

Content integration is an interesting topic in education, both in the research and practical world. For instance, in early 2012, the Atlanta Journal Constitution published a story describing a group of third-grade elementary school teachers' attempt to integrate content across two subject areas in their classrooms. The teachers in this story folded content from a social studies unit on slavery into their mathematics instruction. The results of the teachers' efforts in this regard found their way onto a worksheet of mathematics word problems. Needless to say, the parents of the students in the majority minority school where these teachers worked were less than pleased with questions such as "'Each tree had 56 oranges. If 8 slaves pick them equally, then how much would each slave pick?' and 'If Frederick got two beatings per day, how many beatings did he get in 1 week?'" (Ibata & Anderson, 2012). Of course, this caused quite a stir with the community calling for everything from an apology to the teachers' firing. This assignment was not an isolated incident. In early 2013, a teacher in New York sent a similar assignment home with students. Questions on this assignment included one asking students to determine the number of whippings a slave would receive in a month and how many slaves would be alive after a slave-ship revolt (Eustachewich, Tacopina & Gonen, 2013). The uproar in response to these incidents differed, ranging from claims of cultural insensitivity on behalf of the teachers and calls for disciplinary action, to the parents' embarrassment and discomfort at being forced to respond to questions from their young children regarding a subject as contentious as slavery.

Our assertion is that for integration of this nature to truly provide an increased access to academic content for all students particular attention needs to be paid to not only the content of instruction, but also to the way in which the content is presented. In this vein, we, the authors, sought to answer these two questions: 1) How do teacher candidates negotiate academic content in planning to integrate children's literature and mathematics?; and 2) What are the instructional and logistical implications of this integration? Through an analysis of a course assignment and all of its required documentation, we examine in this paper the ways in which teacher candidates integrate mathematics and literacy, identifying their successes, struggles, and innovations. The results of this study offer some insight to teacher educators in their endeavors to more effectively prepare teacher candidates to integrate content areas and literacy.

MATHEMATICS AND CHILDREN'S LITERATURE

This study responds to the National Council of Teachers of Mathematics (NCTM) standards pertaining to problem solving and communication. To address these standards, we provided teacher candidates an opportunity to engage in instructional planning that leveraged the power of children's literature to offer children a wider array of problem solving strategies and to expose them to a greater range of oral and written language. White (2014) posits that problem solving is often challenging for kindergarten students because they are at the early stages of learning to read, write, add, and subtract, yet she also argues that literature aids in vocabulary development and offers children greater context through which they can access mathematical content. Also, Moyer (2000) highlights the important role of communication in learning mathematics in alignment with NCTM standards and argues "placing mathematics in the familiar context of children's literature makes sense to children because it allows them to see mathematics as an integral part of their everyday experiences" (p. 248). NCTM (1989) extends this argument, focusing on "reading as a form of communication" (p.27). The current instructional focus in mathematics relies more heavily on discussion and reasoning (NCTM, 2000), still placing communication at a premium in the classroom. In other words, children learn mathematics through language, and they use language to express mathematical ideas (Moyer 2000). More importantly, Moyer states, "The foundations of language and mathematical ideas are developed in the elementary grades and the connections teachers can make during this time are critical to children's development" (p. 246). In other words, as many children experience difficulty communicating mathematically, connecting mathematics and literature is vital in supporting children's ability to speak and write in the language of mathematics.

The benefits of integrating mathematics and literature extend beyond those for children. More specifically, Ward (2005) calls for teacher educators to include opportunities for teacher candidates to explore using children's literature to teach mathematics concepts. She states,

> teacher educators need to equip K-8 preservice teachers with the tools and knowledge of pedagogically sound strategies for effectively integrating literature with their future classrooms. By providing my K-8 teacher candidates with such tools, resources, and strategies and, most important, by allowing them to explore and experience children's literature in authentic classroom investigations, I hope to create a microcosm of teacher candidates who are literature savvy and prepared and motivated to teach elementary mathematics in an engaging fashion with a focus on reading, writing, and communicating mathematically (p. 141).

This integration, Ward argues, also allows candidates to confront their preconceived notions regarding how mathematics should be taught.

Hong (1996) also suggests that using literature to pursue mathematics content in classroom offers students a medium through which "children experience the potential wonder of mathematical problem solving" (p. 479). Further, children's literature provides students with meaningful occasions to develop vocabulary and comprehension strategies, as well as to engage with abstract concepts. Hong's view specifically includes a focus on language, even in kindergarten, because "teaching mathematics through children's literature can integrate learning experiences because it provides opportunities for children to express mathematics thoughts and to practice using mathematical language related to the situations in the story" (p. 490). Ultimately, integrating academic content and literacy offers children opportunities to experiences increases in both content knowledge (Caparo & Caparo, 2006; Jennings, Jennings, Richley, & Dixon-Krauss, 1992) and interest in content-related activities (Hong, 1996).

The theoretical perspective that guides this study is reader-response theory (Rosenblatt, 1978; 1995). The view that literacy is a transaction between the text and the reader allows students to interact with text to make meaningful connections to their lives and other academic content. Indeed, these connections are activated by the texts, the instructional decision-making of the teacher in the classroom, and ultimately, the children themselves. More importantly, these connections are fundamental to the learning act in that "the finding of meanings involves both the author's text and what the reader brings to it" (Rosenblatt, 1978, p. 14). We know that students come into classrooms with a vast repertoire of skills and abilities as well as a wealth of knowledge derived from their experiences in the world. However, while generalized background knowledge may not be sufficient to make the meaningful connections to all academic content, it is certainly necessary.

Not all classroom instruction, however, facilitates students' activation of background knowledge and its application to mathematical learning. In fact, Cobb,

Perlwitz, and Underwood-Gregg (1998) argue that traditional mathematics instruction may preclude these types of connections and note that "mathematics as it is interactively constituted in these classrooms is a ritualistic, self-contained activity divorced from other aspects of children's lives, including their out-of-school pragmatic problem solving" (p. 68). We agree and contend that the integration of literature and mathematics provides students with opportunities to engage with mathematics content in ways that lead to increased academic achievement. Further, while some research exists in this vein there is a paucity of research focusing on pre-service teachers and their attempts to integrate these two content areas. For instance, Rogers, Cooper, Nesmith, and Purdum-Cassidy (2015) analyzed teacher candidates lesson plans, isolating the various ways in which the pre-service teachers employed children's literature in mathematics lessons. We extend this work here through an analysis of a course assignment and all of its related documentation, uncovering not just the ways in which teacher candidates integrated mathematics and literacy, but also identifying the ways in which they provide children opportunities to develop problem solving skills, to communicate about mathematical concepts, and to access greater academic content.

METHODS & DATA SOURCES

The participants in this study were students enrolled in a teacher education program at a mid-sized university in the western United States. These fifty-four teacher candidates were enrolled in their penultimate semester of study (the semester before the student-teaching experience). The data sources for this study were collected over the course of two semesters and consisted of assigned, written lesson plans and reflections (see Figure 1 on next page for assignment description). In total, fifty-four lesson plans and reflections were collected and analyzed. The purpose of this assignment was to provide teacher candidates the opportunity to develop lessons that integrated mathematics content and children's literature. Teacher candidates selected a piece of children's literature involving mathematics and to develop a lesson plan incorporating mathematics content and the identified literature. Each teacher candidate chose the specific grade level and mathematics content of their individual lesson, and the other required lesson plan elements included (a) state standards, (b) lesson objectives, (c) formative assessment, (d) description of lesson delivery, and (e) summative assessment. The written reflections outlined the specific criteria for text selection, an analysis of the strengths and weaknesses of the text for use in instruction, and/or any further implications for classroom implementation.

These data were analyzed both quantitatively and qualitatively. Initially, we carefully reviewed all collected lesson plans, identifying the academic content presented and the grade level selected. Then, we analyzed the reflections specifically to uncover the reasons the candidates selected the literature and how they planned to utilize the texts within their lesson plans. We coded these data by identifying key words from the reflections for teaching implications (e. g., introduce, practice, review) and categorized each teacher candidate's work accordingly. We also identified the ways in which the candidates selected texts for their plans and categorized the lessons based on why the texts were chosen. To do this, we listed all of the reasons the candidates provided for selecting their texts from the written reflections. Some initial categories emerged (e. g., engaging, easy access, math is present), which served as a basis for the final categorizing of all of the candidates' work. All of the above data are reported below.

RESULTS

Again, the teacher candidates participating in this study submitted written lesson plans and reflections for analysis. These data sources provide insight into the ways in which the candidates plan to support children's problem solving, communication, and access to mathematics content. Based on the data analysis we report the results in two parts. First, we describe the academic content of the teacher candidates instructional plans, focusing on the selected grade level and mathematics content the plans contain. Then, we discuss the intended implications for integrated instruction, with a specific focus on the purposes the children's literature served within instruction and the text selection criteria the candidates employed. These data are presented below.

Grade level and mathematics content

For the above-described assignment, the teacher candidates could choose any grade, kindergarten through sixth. As shown in Figure 2, the most common grade represented in the lessons was second grade. A little more than a quarter of the candidates planned for instruction in this grade – fifteen of the participants chose second grade. Seven of the teacher candidates selected kindergarten (13% or participants). First and fourth grade lesson plans represented a small portion of the submissions, with only nine candidates planning for each of these grades. Twenty percent of the candidates

Mathematics Assignment

Math with literature (individual work: 25 points)

Description:

The purpose of this assignment is to provide the opportunity of developing a mathematics lesson that integrates with children's literature. You need to select a piece of children's literature involving mathematics that can be developed into a problem-solving lesson or to provide a short mathematics lesson (10-15 minutes). This assignment consists of three parts; writing a lesson plan, a presentation, and a reflection paper. The detailed instruction is as follows;

Instruction:

1. You need to select one children's literature that you would like to use for the short mini mathematics lesson that is similar to 'mathematics concept lesson' we do in the class. You may check with public or school library or your practicum classrooms to find an appropriate book for your lesson. The literature you select should be something other than the book listed in our required textbook (Math and Literature grade K~1 / 2~3 / 4~6).

2. Using your selected literature, you will develop a mini lesson plan based on the 'learning cycle lesson plan' template attached in the syllabus.

3. Write a 1.5~2 page (double spaced) reflection paper of the book. The paper may include the followings but not limited to:

    - Criteria of the selection (why did you choose this particular book)
    - Analysis of the book (strengths and weakness of the book)
    - Implications for teaching (you may want to use some key descriptors to help categorize your suggestions)
      For instance: mathematics concept to teach, mathematic problem to pose, activities to engage, assessment of knowledge, extending the story, etc.

4. Prepare about a 5~6 minute presentation to share your book and a reflection of the book to the class. If possible, bring the book you reviewed to class on the day of presentation. The presentation should include: 1) book title 2) mathematical concept (or theme) 3) abstract of the book 4) implication of how this book can be used in the future mathematics classroom. The specific details and examples will be provided in the class. **The lesson plan is due November 3 and the presentation and the reflection paper are due based on sign-up date.**

Figure 1: ***Mathematics with literature assignment description***

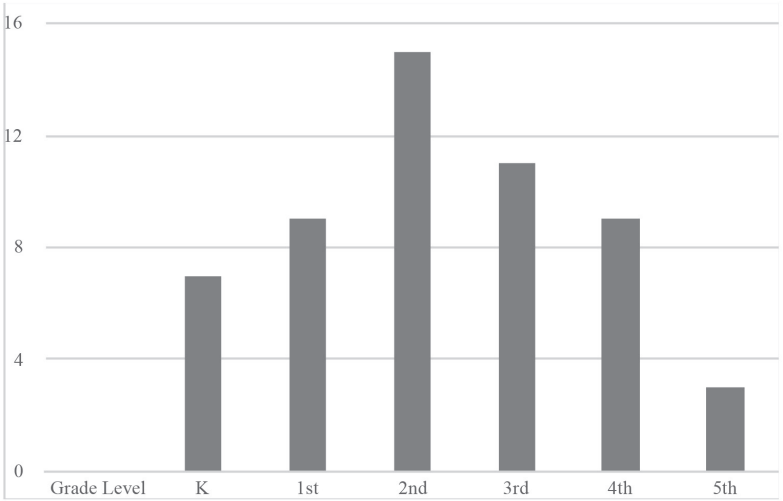

Figure 2: ***Grade levels selected***

planned for third grade, as eleven submissions focused on this age group. Only three of the fifty-four candidates selected to plan their lesson for fifth grade.

Interestingly, when aggregated, these data show a very heavy focus on the primary grade levels (K~3) versus the upper elementary grades (4~6). Forty-two candidates submitted lesson plans focusing on the primary grades. The remainder, twelve candidates, planned lessons for the upper grades. Essentially, the candidates selected the primary grades over the upper grades by almost a four to one margin - 77.8% to 22.2%.

The majority of teacher candidates selected Number/Operation content as the focus of their math with literature lesson plan. As shown in Figure 3, nearly two-thirds of the submissions (35 candidates out of 54) selected this content for their lessons. Measurement was the next most common standard, with a quarter of the students (14 candidates) electing to plan toward this content. Geometry, Data Analysis, and Problem Solving were rarely identified as the academic content for the lessons, with each of these standards represented in 5% or less of the submissions. Of the seven kindergarten submissions, six addressed Number/Operation. One

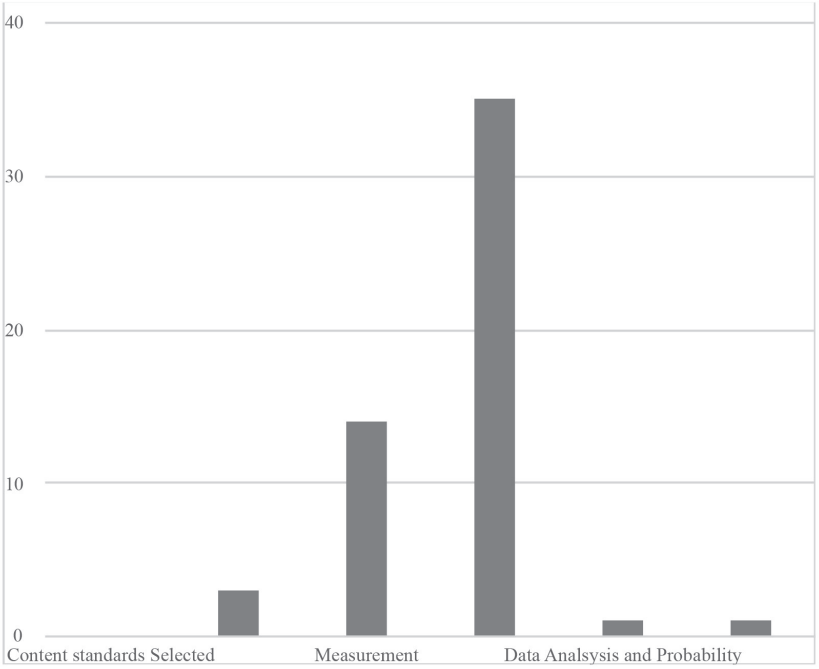

Figure 3: ***Mathematics content standards selected***

lesson in this grade level focused on Geometry. Seven of the nine first-grade submissions also focused on Number/Operation, and two of the lessons in this grade level addressed Measurement. Excluding the one second-grade lesson that addressed Data Analysis, the other fourteen second-grade lesson plans were evenly split between Number/Operation and Measurement. The third grade submissions contained one lesson on Geometry, three lessons on Measurement, and seven on Number/Operation. The fourth grade lessons also focused heavily on Number/Operation, with six lessons addressing this content. Another two lessons in this grade addressed Measurement. The fifth grade lesson plans included one lesson with Number/Operation, one with Geometry, and two with Problem Solving content.

Intended implications for integrated instruction

The teacher candidates designed their lessons for fairly specific purposes, the most common of which were 1) introducing a concept, 2) practicing problems, 3) developing the content knowledge, and 4) providing a context for review. A majority of the teacher candidates wrote that they wanted to use literature to introduce new concepts. For example, one teacher candidate selected Amanda Bean's Amazing Dream (Neuschwander, Woodruff & Burns, 1998), which portrays the story of a young girl, Amanda, who uses multiplication skills to count big numbers. The main activity presented in the lesson had students count objects from the book and discuss the specific grouping strategies they employed in counting the objects. In discussing her instructional decisions related to this text, the candidate says:

> I would like to use this book as I start a lesson on multiplication. I would like to show children why multiplication is so important and how it relates to the world around us. I will focus on the importance of multiplication in order to ensue (sic) the purpose of learning it in the children's minds.

The remainder of the lesson plan presents the procedures of an interactive read aloud. During this activity, the candidate identifies specific aspects of the text related to multiplication as well as offers the students questions such as "Why was it so hard for Amanda to count all of the sheep on the bicycles?" "Why is multiplying easier than counting sometimes?" and "What made Amanda realize that multiplying would be easier?" To conclude the lesson, the candidate asks the students to compute a number of other multiplication problems.

The other ways the teacher candidates used literature were to practice problems, develop specific content, and provide a context for review. One teacher candidate selected the book, Pigs will be pigs (Axelrod & McGinley-Nally, 1994), and explained that he would use this book to practice addition, subtraction, and multiplication of decimals using money from the examples provided in the book. Mathematically, the text revolves around a group of pigs that go out to a restaurant to eat. The lesson requires the students to calculate all money matters from the text. As the candidate states

> On each page where the pigs find money, I will have the students add it up and record it in their math journal. Then when all the money pages are done have them add up the total to see how much money the pigs have to go to dinner.

As the story progresses, the students determine the restaurant bill by combining the cost of the dinner order and sales tax, even calculating the change from the money they found before dinner. Teacher candidate also developed an extension activity to further practice the mathematical content. He states, "I want them to be able to not only solve the pigs' problems but also their own." To accomplish this goal, the students create their own dinner experience based upon the other items on the menu presented in the text and role play the transaction based upon their own mathematical calculations.

To develop specific content knowledge, one teacher candidate identified the text, Sir Cumference and All the King's Tens (Neuschwaner & Geehan, 2009), to teach place value by using addition and subtraction of decade numbers. The candidate provides an explanation of how this text is used in the lesson.

This book can be used in conjunction with a lesson on place value both for four and three digit numbers as you can make a lesson around the 'tents' used in the book to house a different number of people each in each place value. It is a good way for students to visualize each place number and the size that is attributed to each place value.

In other words, the text provides the basis upon which the main instruction is built, and not as an introduction to the lesson, a means for practice after instruction has been offered, or as a review.

Lastly, some candidates identified texts to use specifically as a review of the content after the children received some instruction and practice. For this purpose, one candidate chose the text, The Grouchy Ladybug (Carle, 1996), to review writing time in terms of hours and half hours. She

states, "This book would be used in a whole class lesson as a review after the students have already had lessons on how to write time both on the hour and on the half hour." Specifically, this lesson calls for a mini lesson regarding the telling of time and, afterward, a read aloud requiring students to identify the specific times mentioned in the text, as represented on analog clocks.

In one final example, one of the teacher candidates planned a lesson designed to teach problem solving. She chose the text, One Minute Mysteries: 65 Short Mysteries You Solve with Math! (Yoder & Yoder, 2010), explaining that this text could be used to teach a wide variety of word problems in real world contexts. The candidate planned a problem-solving lesson because she felt "the standards in both fourth and fifth grade emphasize that students should be able to solve word problems. Also students being able to justify their answers is almost just as important as being able to come up with the "right" answer." By focusing on problem solving, a teacher can address a wide variety of mathematical content. In this vein, this teacher candidate extolled the virtues of this text by stating that "depending on what students have been covering in class of the skills/standards the teacher wishes to improve upon, [the teacher] can choose a different mystery." This example highlights the certain benefits of using children's literature to teach mathematics.

Text selection criteria

The assignment discussed above asked the teacher candidates to identify why they chose the specific literature for their lessons. Choosing an appropriate text for instruction is not always a straightforward process, as teachers may need a text to support any number of academic purposes. Along this line, one of the candidates discussed her process in choosing an appropriate text for this assignment.

When first given this assignment, I wanted to use a literary book that I could use to teach a math concept. I wanted a book that had a math concept in it that wasn't immediately obvious, because that's how real life is: math can "sneak up" on you. When I went to the library, though, I couldn't find a book that met that criteria [sic]. All the books I could find were more obviously about math. I think in order to find a literary book, I would have to pay attention when reading books to kids and note when a math concept is present.

In this case, the candidate wanted to find a text through which mathematics could be taught without the content taking too prominent a position in the text. Some of the candidates mentioned the storyline as an issue in selecting an appropriate text for this assignment, but overall, the candidates chose their texts in terms of three basic criteria – student engagement, academic content, and instructional application.

Student engagement.

The teacher candidates were very interested in providing engaging texts to their students. Of course, this criterion was not completely universal, but many of the candidates ensured that student interest was fostered through the text. While candidates were concerned with student engagement generally, the specific aspects of the texts that achieved this goal varied greatly. As detailed in Figure 4, the nature of the selected texts that engendered student interest included "Sesame Street characters," "a fun and crazy cover," "the front flap," "a fun and interactive cover," and "quirky engagement and simplistic style."

"I chose this book for two reasons. The first is that I think that younger students would really enjoy the Sesame Street characters."

"I chose this particular book originally because it had a fun and crazy cover."

"I chose this book…because the front flap made the book sound interesting."

"I chose this particular book because as a college students it intrigued me."

"I selected this book because it looked liked it would be interesting due to the cover…"

"This book is a fun and interactive story that allows students to get involved with the text and solve the riddles on each page."

"…because I thought it be a fun and engaging book for students…"

"I chose this book because of its quirky engagement and simplistic style."

Figure 4: ***Selected quotes pertaining to engagement***

Mathematics content.

In addition to student engagement, teacher candidates took mathematics content into account when selecting texts. As mentioned above, the candidates focused on a slim range of mathematics content. However, this limited view of content within the assignment did not hinder the candidates from selecting texts based upon the specific academic content of the lesson. For instance, one candidate chose a text related to mathematical content her students had been struggling to learn – fractions. Her reasoning for choosing her text was "because [she thought] a lot of students find fractions a little confusing." Another candidate chose a text that aligned to the current content she was teaching in her practicum classroom. She stated, "The foremost reason [I chose this book] was that in my first grade classroom, the students are working on counting and using objects to represent their numbers." Along these same lines another candidate wrote, "I chose this book because I worked with [the students in my practicum placement] on measurement, and I thought that it would be a great book to help students be introduced to measurement in a simpler and more fun way."

This focus on content is certainly well placed in that one candidate mentioned specifically the need to address the specific academic standards as prescribed by the school, district, and state within which she was working. She states, "Another point of criteria I had when looking for a book was that it matched well with a standard. It is really important that we are meeting the grade level expectations in everything we teach."

Some candidates began searching for texts with specific mathematics in mind, basing their final decision on how well their text addressed that content. Other candidates selected texts simply because they contained mathematics in some way. Figure 5 provides further examples of the rationale candidates brought to their text selection, particularly in regard to the academic content present within the texts.

"I chose this book because I think a lot of students find fractions a little confusing."

"I ended up choosing this book because I was hoping to find a really good book that can teach fractions."

"I also chose this book because it was very straightforward with the concept of addition."

"Another reason for choosing this book was [to] measure different parts of a dog using standard and non-standard measurements."

"The foremost reason [I chose this book] was that in my first grade classroom, the students are working on counting and using objects to represent their numbers."

"I chose to use this book because it can be used to teach…many mathematical concepts that can be taught to younger students as well as older students."

"I chose this book because it uses different ways to group objects and really helps students understand that there are many techniques they can use to help them add faster."

Figure 5:
Selected quotes pertaining to academic content

Instructional application.

Lastly, the teacher candidates chose texts to integrate mathematics and literature based upon the instructional applications either explicit or implicit within the text. One candidate fully explicated the instructional implications of the text she selected:

> I chose this particular book because it does a good job teaching students the value of coins. Each time Harriet thinks she has a dollar in coins she adds them up. For example, the story reads, "Harriet knew that each nickel is five cents, so she counted the nickels by fives; 5, 10, 15, 20, 25…100. 100 Cents! Another dollar! Now I have two dollars." The other side of the page has a picture of twenty nickels to represent a dollar, so students can actually see how much a dollar is worth in nickels. [It] does this for every coin. I thought this was a great way to teach coin value.

Another student chose a text to teach time.

> I chose this particular book because on each page where it talks about a particular time, it shows that time on an analog clock in the corner of the page. This is a great way for students at

> this young age to make a visual connection between what is happening in the story and what time it is happening according to a clock. This is also a great way for students to use a clock in their classroom to demonstrate the times that are in the story as well.

Within the other submissions, the candidates identified texts that supported both student engagement and mathematics content through specific instructional activities, either resident within the text or found from outside sources. She states

> I also think this book can be used for a variety of activities like teaching students to group objects in order to count them faster and then introducing them to multiplication. There are also a lot of other resources that can be found online to have your students do for an extension, which is why I really liked this book as well. One example of an extension is to use fun manipulatives for students to count. They can put the objects into groups of tens and then count by ten to find the total or they can count the number of groups and multiply ten by the number of groups to get their total.

Ultimately, the candidates selected texts that either provided or served as the inspiration for the instructional activities for the lesson.

DISCUSSION

The purpose of this study was to investigate the ways in which teacher candidates utilize children's literature to teach mathematics through the development of mathematics lesson plans and reflection on the planning process. The results indicate that teacher candidates did use literature in teaching mathematics, yet in a limited way. In this case, the participating teacher candidates relied more heavily on the primary grades and Number/Operation content. One possible explanation for this might be due to a relationship between the candidates' grade level in their practicum placements and the selected grade level for this assignment. The grade levels were chosen by the candidates and prescribed by the assignment. Whatever the reason for this reliance on the early elementary grades, further research should be conducted to explore the influence field placement grade levels have on course assignments. These preferences, no matter their origin, constrain the opportunities the candidates have to develop a wide range of instructional and content-based proficiencies. Most compelling in these data, however, is the relatively little focus candidates placed on Problem Solving as the content of their plans. Our data demonstrate that only one out of fifty-four lesson plans solely focused on mathematics instruction related to problem solving. In fact, the benefits of literacy integration with any content area, as highlighted in the research, qualify it as a high-leverage practice (Ball, Sleep, Boerst, & Bass, 2009). These benefits include exposure to problem solving in real-life situations (Bintz & Moore, 2002; White, 2014), access to a greater range of academic content and context (Caparo & Caparo, 2007; Jennings et al, 1992; Mantzicopoulos & Patrick, 2010), and enhanced communication skills (Hong, 1996; Moyer, 2000; Pappas, 2006; Schiro & Lawson, 2004). Unfortunately, these benefits were rarely leveraged in the candidates' lesson plans or discussed in their reflections. These data suggest that teacher candidates need support in identifying moments within instruction where the benefits of integration can be realized.

The text selection criteria employed by the teacher candidates – student engagement, academic content, and instructional application – highlight the importance of carefully considered texts within instruction. Hellwig, Monroe, and Jacobs (2000) posit that appropriately selected text can enhance instruction, build positive connections, and enable students to engage in mathematics meaningfully. The candidates achieve these ideals, yet they still need to leverage them toward developing increased problem solving and communication skills. Any number of classroom activities can help address this need. For instance, "interactive read-aloud and shared readings provide the teacher with an opportunity to foster discussion about content area texts" (Fisher & Frey, 2014, p. 598), and in so doing, the teacher can provide expanded opportunities for students to access instructional content.

The findings of this study suggest that it is important for candidates to have opportunities go beyond an initial experience in their methods courses to think more deeply about the purpose and the benefit of the integration of mathematics and literature in teaching mathematics. For instance, teacher candidates can share and discuss a wide range of children's literature during mathematics methods courses as a debriefing activity after the completion of an assignment similar to the one reported on here. Another way to develop these skills in teacher candidates could be to ask them to create meaningful mathematics problems derived directly from specific texts, allowing the candidates to identify the mathematical content within a single text.

Finally, teacher candidates need more opportunities to learn what it means to teach mathematics meaningfully using children's literature through collaboration with expert practitioners such as methods instructors in their preparation programs or mentor teachers in elementary school classrooms (see Darling-Hammond, 2010 for more on collaboration and its effect on student learning; see also Ball & Forzani, 2010 for more on supporting teacher candidates in practicum experiences). Without these learning experiences, developing meaningful instruction might remain challenging for candidates when they enter their teaching career as licensed teachers.

IMPLICATIONS FOR FURTHER WORK

We believe that the findings of this study lead us to some interesting considerations for teacher educators. First, teacher educators need to attend to the specific parameters of the assignment. Also, teacher educators must focus candidates' attention on the benefits of content integration. Lastly, teacher educators and teacher education programs themselves should provide more effective field experiences that highlight content integration in action.

Specifically designed assignment parameters

As the data suggest, teacher candidates do not necessarily choose wide range of grade levels or mathematical content on their own within this assignment. While this is not necessarily a negative, as we do want our candidates to explore areas of interest and strengths, as teacher educators, we need to provide our teacher candidates with opportunities to go beyond their strengths to expand further their content knowledge and pedagogical expertise. For instance, the assignment could require that individual candidates engage in a specific mathematical content or grade level. Another possibility within this assignment could allow candidates to plan two lessons, one of the primary grades (K~2) and another in the upper elementary grades (3~6). Further, teacher educators could ask teacher candidates to align every elementary grade level with the mathematics content standards or to identify five or six children's literature texts that address the various mathematics content standards. In this way, teacher candidates can produce and engage with lessons that include individual kindergarten-sixth grade lessons focusing on Number/Operation, Measurement, Geometry, Data Analysis and Probability, and Problem Solving. Accordingly, we can provide our candidates with examples of how each of the mathematics standards can be addressed in each of the grade levels.

Focus on the true benefits of integration

In this study, the teacher candidates did not leverage two of the main benefits of content integration to their fullest extent - problem solving and communication. It is possible that the course within which this assignment was situated did not focus enough instructional time on these benefits. Despite this possibility, as teacher educators, it behooves us to make sure that our students are not only technically capable in terms of instructional practices but also theoretically and empirically informed. That is, teacher candidates need to develop a level of professionalism that includes their understanding of not only what they're doing in their classrooms but also why their classroom practices are effective. To achieve this, teacher preparation courses that contain content related to integration need to ensure that candidates are fully informed as to the benefits of their instructional choices. This goal can be achieved through a number of different means – lecture, course readings, in-class student work, and/or course assignments.

Provide more effective field experiences

Of course, any time research identifies the need for specific field experiences or modifications to existing field experience programming, teacher educators run into logistical issues over which they have no control. Yes, we would recommend that teacher candidates enter into their practicum and student teaching experiences with classroom teachers who engage in content integration that leverages the power of problem solving and communication. However, finding schools and classroom teachers that engage in this type of work may not always be possible to satisfy the number of placements teacher education programs schedule each semester. Roadblocks to impacting this type of recommendation include district-wide curricular choices, particular teacher's professional preparation, expertise and development, and the specific needs of the students in the individual classrooms and schools. Indeed, teacher education programs should vet their cooperating teachers with a specific eye towards the specific instructional and professional expertise through consistent professional development. This vetting should be done wherever and whenever possible. However, teacher educators should also identify teachers who engage in these practices with particular skill and invite them into university methods courses to work directly with teacher candidates in leveraging the full benefits of content integration. Essentially, whenever and however possible, teacher educators should engage any and all experts and practitioners towards the preparation of effective teacher candidates in this regard.

CONCLUSION

In summary, teacher candidates are able to integrate mathematics and children's literature, providing students opportunities to engage texts and academic content. However, they need the help of teacher educators and experienced professionals in the classroom to capitalize on this kind of integration to develop problem solving and communication skills in students. The instructional examples presented at the beginning of this article are a cautionary tale for teachers and that choosing integration as a whimsical option in the classroom, or at very least integrating content for integration's sake, can lead to unexpected outcomes, many of which have no connection to the academic learning of children. As professionals, though, teachers should make decisions in the classroom based upon sound educational theory and apply these decisions toward supporting the academic needs of their students. In this case, the effective combination of mathematics and literacy should be leveraged toward specific benefits – access to academic content and increased opportunities to develop problem solving and communication skills.

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