

Tennessee Educational Leadership

A TASCED Publication

Tennessee Educational Leadership (TEL) is a peer reviewed journal intended to communicate information, ideas, theoretical formulations, and research findings related to leadership, supervision, curriculum, and instruction. Starting with ***Volume 43***, the ***TEL*** will appear in an online format with national open availability. Distribution will include Tennessee Association for Supervision and Curriculum Development (TASCED) members and others with an interest in supervision/leadership, curriculum development, and instruction at both the university and school-based levels. The journal is nonthematic and aims to promote discussion of a broad range of concepts, theories, issues, and dissemination of the knowledge base for professionals in education.

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Letter from TASCED President Steve Maclin

September 1, 2019

Dear TASCED Members,

Thank you for your hard work, dedication, and service to the students in Tennessee. As we have begun another school year in our state in the last few weeks, I think about the importance of building relationships with our students.

Students want to know two things about their teachers, “Can I trust you?” and “Do you care about me?”. We know that we serve children who range from the wealthiest of the wealthy to the poorest of the poor. Yet, they all need the same thing, a teacher they can trust and that cares about them. Tennessee’s teachers are tasked with a difficult job which we do every day in spite of the challenges faced across the state. We work to invest in relationships, encourage, serve, care, build trust, and bring out the best in our students.

We are Tennessee educators. At TASCED our mission includes providing high quality professional development for our profession. Our quarterly journal, social media postings and annual summer institute all work for that goal. We are glad that you are here and thank you for being part of our professional network.

From all of us at TASCED, we hope 2019-20 is your best school year ever!!

Yours truly,

A handwritten signature in cursive script that reads "Steve Maclin".

Steve Maclin
TASCED President

Message from TASCED Executive Director Steve Simpson

Dear TASCED Members,

Thank you for your continued membership with TASCED, and your commitment to excellence in education across the state and in your district. TASCED will continue to provide high quality professional development for educators and also network educators across the state of Tennessee.

Lately I've been reading a book "The 7 Habits of Highly Effective People" by Stephen Covey. In the book, it describes 7 quality habits to live by. They are: "Be Proactive, Begin with the End in Mind, Put First Things First, Think Win-Win, Seek First to Understand, then to be Understood, Synergize, and Sharpen the Saw." The book describes ways to become highly effective by following these guidelines. Throughout the book one thought comes to mind... Empowerment. Webster's Dictionary defines Empowerment as "the act or action of acts or duties." Think about the possibilities staff and students would have to become empowered by these 7 habits and found their "voice" (Stephen Covey) to become leaders. As we begin the school year, I encourage everyone to grow your staff and students to become leaders in their own right, and empower them to take on responsibilities to grow academically, socially, and in their careers.

We are excited to announce that Dr. Joseph Murphy, Ph.D. from Vanderbilt University, is our keynote speaker June 22-23, 2020 at Vanderbilt University for next year's TASCED Summer Institute! Dr. Joe Murphy is best known for his work in Educational Leadership and creator of the TILS standards. His focus in the summer institute of 2020 will be on academic press and school culture! Join us for two full days of exciting learning with Dr. Murphy. We are relocating to Nashville next year to provide TASCED's Summer Institute. Place it on your calendar now as more details will come in September. Please visit www.tascd.org for more details, and follow us on Twitter as well @TennesseeASCD.

All best,

A handwritten signature in black ink, appearing to read "Steve Simpson", with a stylized, flowing script.

Steve Simpson – TASCED Executive Director

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Invitation to Submit Manuscripts

Review process: Authors will receive acknowledgment regarding receipt of their submission. Manuscripts that meet **TEL** specifications will be peer-reviewed. Except for the cover page, **TEL** requires that you omit any identifying information to ensure a blind review.

Submission requirements: Authors should email an electronic version of the manuscript to Dr. Thomas Buttery, butteryt@apsu.edu.

Style: Authors should use the “Publication Manual of the American Psychological Association” (APA) (6th edition). Number all pages, but please do not include a running head.

Length: Manuscripts, including references, tables, charts and figures normally should not exceed 15 pages; however, we recognize that length of articles varies according to topics.

Word-processing: Format manuscripts via Microsoft Word Times Roman font and double-spaced, 12-point text, with one-inch margins. Authors should use tabs and indents instead of spaces to standardize the format. Please place tables, charts, and figures at the end of the manuscript.

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Abstract: A concise 100-word, double-spaced narrative should be included at the beginning of the manuscript.

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The *TEL* Journal is a peer-reviewed publication of the Tennessee Association for Supervision and Curriculum Development. The mission of the *TEL* Journal is communication of information, ideas, theoretical formulations, and research findings related to leadership, supervision, curriculum, and instruction. The points of view of authors are not necessarily reflective of the association or journal editors. Authors are responsible for the accuracy of information and legal use of all materials within their manuscripts.

Becoming a Team: Establishing Conditions for Critical Collegueship and Shared Leadership

Sara Donaldson Wheaton College Massachusetts

State and national instructional leadership standards emphasize the importance of shared leadership and collective accountability for developing organizational capacity to promote student and teacher learning. Reconfiguring systemic conditions to promote educators' ability to work as agentic and interdependent team members requires development of a professional culture that values discourse and disequilibrium as a source of learning and growth. This article examines the process used with a group of 20 elementary mathematics instructional leaders that enabled collaborative inquiry around shared problems of practice and resulted in development of more positive perceptions of collective efficacy for teaching.

Although the idea of leadership has often been attributed to the characteristics and behaviors of a single individual, existing state and national leadership standards recognize that educational leadership requires effective collaboration, empowerment, and mutual accountability among diverse stakeholders (NPBEA, 2015; TSBE, 2013). Tennessee's leadership standards espouse that instructional leaders must work to build system capacity by leveraging educator strengths, modeling and communicating shared ownership for student success, and establishing a sustainable environment for professional learning and growth through evidence-based, job-embedded collaborative inquiry (TSBE, 2013). This article examines the structures and conditions needed to promote a culture of shared accountability and strong beliefs about collective capacity to promote student and teacher learning success, through an examination of existing literature and a case study of capacity building among elementary mathematics leaders in one urban district.

Promoting Organizational Capacity for Professional Learning

Existing contextual or environmental factors in complex social institutions, such as public schools, often limit collaborative reform efforts and organizational capacity, or a system's power to support both student achievement and professional learning (Andrews & Lewis, 2004; Cosner, 2009; McFadden, 2013). Shifting change efforts away from top-down attempts to fix weaknesses toward building upon professional strengths (Jensen & Luthans, 2006; Smith, Besharov, Wessels, & Chertok, 2012) develops internal leadership capacity and promotes efficient diffusion of existing knowledge and resources, thus enhancing overall organizational capacity (Onorato, 2013; Smith et al., 2012). Shared leadership supports professional community development by shifting from "the belief that leadership is a unique characteristic that an individual has developed to a belief that teachers have a pragmatic understanding of the needs of the school and the school community as well as individual sets of skills and knowledge" (Nappi, 2014, p. 33). The resulting aggregated effort and enhanced

cooperation encourages active participation in decision making, develops feelings of ownership and autonomy, and increases the likelihood of instructional innovation and student success (Nappi, 2014). Additionally, when strong professional support networks (PSNs) have norms and support structures in place that encourage risk taking and experimentation, instructional change is fostered and sustained as individuals feel safe and empowered (Bryk, Camburn, & Louis, 1999).

Attending to specific features of supportive professional learning contexts is vital as PSNs will not function effectively without a culture of collegial trust, shared accountability, and individual agency (Coburn, Mata, & Choi, 2013; Shulman & Shulman, 2004). When collaborative norms and structures are in place, PSNs promote a shared sense of responsibility and leadership that fosters the depth of interaction needed for critical discourse about new approaches in terms of existing assumptions and practice (Cobb & Jackson, 2015; Frank, Zhao, Penuel, Ellefson, & Porter, 2011; Valli & Buese, 2007). These critical exchanges of ideas and information, in turn, promote individual perceptions of collective efficacy for teaching (C-EFT), or educator's beliefs about students' achievement potential and their collective capacity to promote student achievement (Bandura, 1997; Goddard, Hoy, & Woolfolk-Hoy, 2000).

Hattie's (2012) work on visible learning and teaching indicates teachers' C-EFT perceptions have a more significant effect on students' success than any other personal or contextual factor. Positive C-EFT perceptions promote educators' willingness to honestly analyze their impact on student learning and performance and to openly engage in structured conversations with colleagues about a critique of personal

practice in recognition that current practice can be improved (Donohoo, Hattie, & Eels, 2018; Hattie, 2012). As a result, educators move beyond mere discussion, engaging in critical collegueship, or the ability and willingness to recognize discourse around divergent perspectives of core practices (Hamann, Lane, & Johnson, 2001). Regular engagement in productive disequilibrium and purposeful discourse about student performance becomes a source of improved practice as opposed to frustration and ill will, builds cohesion of teaching and learning, allows for increased reflective practice, and promotes positive C-EFT perceptions (Hamann et al, 2001; Linder, Post, & Calabrese, 2012). Because collaborative scrutiny of personal practice is not a common or a core professional development routine in most U.S. school systems, it can feel unnatural and even painful (Males, Otten, & Herbel-Eisenmann, 2010). Therefore, development of an emotionally safe professional learning environment that values self-reflection, ambiguity and uncertainty, empathetic understanding, and collective work is a vital condition for success (Hamann et al., 2001; Males et al., 2010).

Methods

Effective professional learning communities that promote teamwork, productive discourse, and shared leadership cannot simply be designed but instead must be created through the careful cultivation of participant engagement that balances structure and autonomy. A recent study conducted in the Libertyville Public Schools (a pseudonym), an urban district in New England, examined the impact of increased opportunities for collaborative inquiry and critical collegueship on educator's C-EFT perceptions.

Participants and Context

The six-month study involved Libertyville's 20 elementary mathematics coaches, each of whom supports mathematics teaching and learning at one of the district's elementary schools. The study supported the district's mission to shift the focus of the mathematics coaches from school-based isolation to seeing themselves as part of a district team with shared accountability for district-wide teaching and learning success. Needs assessment findings showed a lack of strong PSNs in the district and weak perceptions of teachers' C-EFT amongst the mathematics coaches, factors found to impede educators' ability to meet students' mathematics learning needs (Goddard et al., 2000; Minckler, 2014). An intervention was designed to build upon existing individual assets and district structures to develop systems and a culture that would promote sustained organizational capacity growth through improved C-EFT perceptions and critical collegueship development (Minckler, 2014).

Intervention Design

The intervention design attended to both: (a) providing a structured inquiry process that supported autonomy, was embedded within daily practice, and promoted shared leadership; and (b) developing strong, interschool PSNs that encouraged productive discourse around authentic problems of practice and encouraged shared accountability for both professional learning and student achievement. At the core of this work was the promotion of strong professional relationships and a culture that encouraged risk taking and collective accountability. Critical collegueship requires clear articulation of individual accountability, norms for communication and collaboration, and development of collegial trust (Cosner, 2009; Males et al., 2010; Thompson & MacDonald, 2005). Although 18 of the 20

participants had worked as instructional coaches in the district for at least a year prior to the start of the study, their work together had been limited to monthly elementary mathematics coaches' meetings that centered on completion of tasks assigned by district administrators and development of content and instructional coaching knowledge and skills. As a result, even though they knew each other, each coach worked in isolation at their individual buildings and not as part of a cohesive or coordinated team focused on district capacity building. This intervention worked to develop trust between team members by (a) establishing structures and expectations for honest communication, collective decision making, and conflict resolution and (b) supporting the identification and development of inquiry goals based on shared needs and interests. These two steps are vital for leveraging collective capacity and enacting change as individuals begin to work as an interdependent team instead of as independent members of a group (Donohoo et al., 2018; DuFour, 2016; Goddard et al., 2000).

Establishing clear norms and expectations for collaboration, mutual support, and accountability, as well as establishing a specific work focus, are vital for successful development of interdependence (Cosner, 2009; DuFour, 2016; Thompson & MacDonald, 2005). This work began with assigned teams of coaches ($n=4$ or 6) engaging in discussions about an open mathematics task (see Figure 1). First the coaches came up with an individual answer to the problem, then shared and compared answers and approaches, and finally connected this activity and discussion to their work as instructional leaders. This task-based discussion was followed by an examination of differences between working as a group and working as a team by focusing

on three key shifts: shared leadership, autonomy, and interdependence (DuFour, 2016). Coaches noted they were currently working as a group focused on completing assigned tasks and that shifting to functioning as a productive team of instructional leaders would require more autonomy, a shared vision for success, and increased opportunities for collaboration and communication. This discussion of working as a team was followed by time for teams to begin developing structures and systems for their collaborative inquiry work by creating a team charter for collaborative norms and responsibilities and determining their collaborative inquiry focus.

Each team created a team charter using a modified version of the CATME Team Charter (n.d.) template to establish norms, role expectations, and communication guidelines. This protocol supported proactive

discussion of communication preferences and potential team work barriers, as well as expectations for roles and norms to guide subsequent meetings. With these expectations in place, each team used student data and existing school improvement plans to establish one teaching and learning goal about a shared problem of practice. Teams then established an initial action plan and sub-goals to guide their site-based collaborative inquiry work and bi-monthly meetings, referring to and revising their plan and team charter as needed.

With a goal of promoting both sustainable professional learning support and the instructional leadership capacity of the participating elementary mathematics coaches, autonomy and agency were key considerations of the intervention design. Teacher agency supports feelings of community belonging, helps educators connect learning to daily practice, and


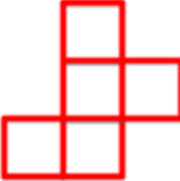


<p>On your own explore:</p>  <p>This piece is $\frac{1}{5}$.</p>  <p>What does the whole shape look like?</p>	<p>As a team, discuss:</p> <ul style="list-style-type: none"> • How are your solutions similar? • How are your solutions different? • Whose solution is “correct”?  <p>As a team can you come up with any other solutions?</p>
<p>Altogether talk about:</p>  <p>How did your team discussion help expand the number of solutions you were able to find?</p> <p><i>How does this connect to your daily work as math coaches?</i></p>	

Figure 1. Screenshots of presentation slides structuring discussion of an open-ended task as an analogy for team work collaboration.

promotes PSN development as individuals draw upon each other's expertise and experience (Calvert, 2016). Allowing coaches to determine the goals, action plans, and norms for collaboration and discourse promoted agency and their shift to functioning as interdependent teams of educators.

Findings

A primary goal of the study was to determine if increased opportunities to engage in critical collegueship and collaborative inquiry with interschool peers would influence teachers' C-EFT perceptions as a source for organizational capacity development. Changes to C-EFT perceptions were examined using the task analysis (i.e., beliefs about collective ability to promote mathematics learning) and group competency (i.e., beliefs about collective mathematics skills, pedagogy, and knowledge) subscales of Goddard and colleagues (2000) Collective Efficacy for Teaching Scale. To determine whether a significant change in perceptions had occurred, a paired-samples *t*-test for means was conducted comparing pre- and post-intervention C-EFT perceptions using Microsoft Excel (see Table 1). A statistically significant change was found for participants' perceptions of both components of C-EFT: group competency [$t(20) = 2.17, p = .04$] and task analysis [$t(20) = 2.14, p = .04$]. This indicates that, collectively, participants' perceptions of the collective skills and knowledge of the educators across the district and their collective capacity to promote students' mathematics achievement became more positive over the course of the study. These findings also indicate more positive perceptions of the power of district PSNs to support and distribute knowledge and resources within and across schools.

Table 1

Paired Two Sample t-Test for Pre- and Post-Intervention Means: Collective Mathematics Efficacy for Teaching (MEFT) Perceptions (n = 21)

Variable	Administration	M (SD)	t	p
Group Competency	Pre	4.18 (.65)	2.17	0.04
	Post	4.55 (.39)		
Task Analysis	Pre	4.39 (.51)	2.14	0.04
	Post	4.69 (.40)		

Note. Responses based on a seven-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (7).

Implications for Practice

Overall, findings indicate focusing professional development efforts, especially for school-based instructional leaders, on promoting shared accountability and positive C-EFT perceptions may be an effective approach to promoting organizational capacity in terms of students' achievement and educators' ability to support their own ongoing professional growth. High-performing systems are bottom-up systems that have clear, prescriptive expectations of what constitutes quality professional learning established from central administration and distributed across three levels of instructional leadership: peer leaders within schools, system leaders of professional learning, and principals to ensure professional learning aligns to school improvement plans (Jensen, Sonnemann, Roberts-Hull, & Hunter, 2016). This study was designed with shared leadership in mind. The school-based mathematics coaches were targeted due to

their potential to support schoolwide cultures of collaboration and peer support, as they work to connect district professional development goals with classroom teaching and learning needs (Killion & Roy, 2009). Beginning with small, interschool teams comprised of school-based instructional leaders, such as these mathematics coaches, creates initial capacity for collaborative inquiry and helps build a coalition that can be expanded in subsequent years to include more educators, with the members of these original teams becoming facilitators for either intra- or interschool teams (Nelson, Perkins, & Hathorn, 2008).

Based on an examination of this study's results and existing empirical literature, it appears three key factors most influence critical collegueship development and promote positive C-EFT perceptions: (a) balancing structure and autonomy for collaborative inquiry work, (b) structuring conversations around daily practice, and (c) attending to team development in terms of culture and expectations. With these factors in place, strong PSNs are likely to develop, supporting critical collegueship and a shared vision for instructional change and organizational success as individuals willingly engage in productive discussions of practice, policy, and beliefs (Bryk & Schneider, 2003; Ringleb & Rock, 2012).

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Teachers' Perceptions of School Culture and Professional Development Related to Technology

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Sherri K. Prosser

Alexandria City Public Schools
Austin Peay State University

Preparing new teachers for the rigors of 21st century teaching is daunting. As veteran teachers retire, teacher education program facilitators must adapt to the ever changing and increasing demands that new teachers face. The Middle Tennessee State University Residency I program for secondary education focuses on three signature strategies to help prepare teacher candidates for the challenges ahead: Problem-Based Learning, guidance from multiple program facilitators, and continuous guest lectures from our surrounding district partners. These three interlocking strategies ensure that our teacher candidates survive and thrive not only during student teaching but also throughout their careers.

As schools strive to keep pace with 21st learning and skill acquisition, a sizeable gap persists between what students learn in school and what they will need to know to be successful in typical higher education environments and employment opportunities (Partnership for 21st Century Skills, 2016). To prepare students for post-secondary opportunities, teachers must be able to effectively integrate technology in their classroom instruction (Partnership for 21st Century Skills, 2016), which can afford opportunities for learners to create knowledge (Yu, 2013). Technology integration has been defined as the “use of hardware such as laptops, scanners, smart boards, document cameras, digital cameras, digital camcorders, and handheld computers, as well as related software and the Internet, in classrooms for enhancing learning” (Hsu, 2016, p. 31). Whether the school culture supports technology innovation can influence teachers’ desires to integrate technology (Levin & Schrum, 2014). School culture can be defined as the “inner reality” of a school that signifies the school’s atmosphere or learning environment (Deal & Peterson, 1999). Similarly, a supportive school

leadership dynamic is also critical in fostering a culture and an environment that is conducive to technology use (Kopcha, 2012; Şahin, 2011).

Literature Review

Numerous barriers to effective technology integration exist. First-order barriers are extrinsic to teachers and include insufficient: technology access (Hechter & Vermette, 2014), time (Hsu, 2016; Wachira & Keengwe (2011), professional development (PD) opportunities (Jones & Dexter, 2014), and a school culture that does not support educational change (Li & Choi, 2014). Second-order barriers are intrinsic to teachers and include: beliefs about technology use (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012; Kim, Kim, Lee, Spector, & DeMeester, 2013; Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2010), technology knowledge (Harris, Mishra, & Koehler, 2009), and self-efficacy regarding technology implementation (Glassett & Schrum, 2009). Regarding first-order barriers, teachers’ technology integration efforts are exacerbated by PD offerings that fall short in

preparing teachers to effectively use technology (U.S. Department of Education, 2016). Many current technology PD models are not equipped to prepare teachers to effectively integrate technology (An & Reigeluth, 2012; Jones & Dexter, 2014; Topper & Lancaster, 2013) and may not offer learner-centered instruction (An & Reigeluth, 2012), may not be tailored to the unique needs of a 1:1 environment (Topper & Lancaster, 2013), and may not encourage peer collaboration (Jones & Dexter, 2014).

Although first-order barriers (e.g., technology access) are decreasing, second-order barriers to technology integration remain problematic (Jones & Dexter, 2014; Li & Choi, 2014). The role of teacher beliefs in technology integration cannot be understated. Teacher beliefs are fundamental in teacher willingness to integrate technology (Ottenbreit-Leftwich et al., 2010). School culture, which can be defined as an environment that is conducive to positive academic growth, (McKinney, Labat, & Labat, 2015), can also play an important role in teachers' desire to take risks and innovate, specifically in the area of instructional technology (Li & Choi, 2014; Perrotta, 2013).

Although school culture and other school-level characteristics may be important in influencing teachers' practices and expectations for technology use than teachers' individual characteristics, teachers have specifically identified school leadership as integral in supporting innovative actions (Perrotta, 2013). The creation of an environment that encourages collaborative technology efforts and the sharing of best practices with peers is central to teachers' technology integration efforts (McKinney et al., 2015). Teachers in learning environments that support technology experimentation are more likely to adopt instructional

technologies (Christensen & Knezek, 2017). The integral role of school leadership is illustrated in the Tennessee Instructional Leadership Standards (Tennessee Department of Education, 2015); specifically, Standard B, Indicator 5, which describes the need for leaders to model and communicate expectations to lead to shared ownership of success. Additionally, Standard C identifies a need for leaders to support differentiated learning opportunities (Indicator 4), collaborate with others (Indicator 5), and improve their own self-practice based on feedback received (Indicator 7).

Context

The context for the study was a public school district located near a large metropolitan area on the East Coast. The district featured a diverse student population of more than 16,000 students from 80 countries who speak 60 languages and who identify as Hispanic (36.08%), Caucasian (28.46%), African American (26.83%), Asian (5.32%), and Multi-racial (2.88%), Native American (0.20%), or Native Hawaiian/Pacific Islander students (0.17%). More than 61% of students are eligible for free and reduced-price meals.

The district was small in comparison to surrounding districts and featured a single large comprehensive high school: Sterling Creek High School (all names are pseudonyms), which enrolled nearly 3,500 students across four distinct campuses. The main campus and a separate ninth-grade campus constituted traditional high school campuses. An academy campus, for students with disciplinary concerns, and a satellite campus, designed to accommodate students who required a more flexible schedule than is typically offered in a traditional school environment, comprised the alternative high

school campuses. The high school employed 19 administrators and 280 teachers. The first author was one of three technology integration specialists assigned to the comprehensive high school at the time of data collection.

Teachers in this district had smaller class sizes than surrounding districts and did not have supplemental duties (e.g., lunch, bus, or hall supervision), due to the district's commitment to instructional technology and a belief that teachers should focus solely on instruction. Student access to technology was a priority and students in Grades 3–12 were part of the district's 1:1 initiative of 11 years, in which every student was provided with a school-issued portable computing device. Students without home Internet access could borrow portable Wi-Fi devices from their school or visit locations throughout the city that were equipped with school division hotspots. Sterling Creek High School had three technology integration specialists and an in-house technology helpdesk.

Purpose

Given that technology can revolutionize learning when used effectively by teachers (U.S. Department of Education, 2016) and can prepare students for post-secondary educational and workplace experiences, it is imperative that teachers be able to successfully integrate technology into their classroom instruction (Partnership for 21st Century Skills, 2016). The persistence of first-order and second-order barriers to technology integration, even within 1:1 environments, can result in low levels of technology integration (An & Reigeluth, 2012). The first-order barrier of technology PD, for example, may stem from a school culture that does not support technology efforts (Li & Choi, 2014). In the study context, the first author noted uneven

technology integration among faculty. The purpose of this survey-based study, therefore, was to understand teachers' perceptions of how technology PD offerings and school culture support or hinder their technology integration and was guided by two research questions:

1. What are teachers' perceptions of the effectiveness of technology PD offerings, as related to levels of subsequent technology integration?
2. What are teachers' perceptions regarding administration and their school culture in supporting technology integration?

Method

The participants were 140 Grades 9–12 teachers across four campuses in a mid-Atlantic suburban city bordering a large metropolitan area. The respondents, ages 23 to 83, were from 12 of the 13 possible subject areas and were state licensed and credentialed. Several were first-year teachers, but 75% of the respondents had 6 or more years of teaching experience. The mean years taught at the current school was 3.39.

A 13-item, researcher-developed Google Forms survey was created based on a review of the literature about barriers to technology integration. Seven items used a Likert scale, with a rating of 1 corresponding to *strongly disagree* and 5 corresponding to *strongly agree*. The remaining six items captured teacher demographic data. As the high school had already addressed the first-order barriers of access and time, the survey focused on teacher perceptions of technology PD offerings and school culture, including administrative support. A sample item that measured the perceptions of the effectiveness of PD offerings was: "After participating in existing technology PD opportunities, I feel

prepared to integrate technology” (see Table 1). A sample item that measured the perceptions of whether the existing school culture supported or inhibited the integration of technology was: “Teachers and administrators work together to develop technology integration expectations” (see Table 2).

The first author, a current administrator in the district, presented study information at each campus faculty meeting to recruit participants. A link to the anonymous Google Forms survey was emailed to teachers’ following the meetings and remained open for 2 weeks. The survey responses were analyzed using descriptive statistics via Google Forms analysis metrics and Microsoft Excel. As Likert scales are ordinal, however, a frequency analysis was done and modes were reported (Kuzon, Urbanchek, & McCabe, 1996).

Findings

The first research question sought to determine teachers’ perceptions of the relationship between the effectiveness of

Table 1
Teacher Perceptions Regarding Professional Development Opportunities (N = 140)

Item	% (n)
I have had adequate training in technology use.	
5 – <i>strongly agree</i>	20 (28)
4 – <i>agree</i>	37.9 (53)
3 – <i>neutral</i>	29.3 (41)
2 – <i>disagree</i>	10 (14)
1 – <i>strongly disagree</i>	2.9 (4)
After participating in existing technology PD opportunities, I feel prepared to integrate technology.	
5 – <i>strongly agree</i>	16.4 (23)
4 – <i>agree</i>	38.6 (54)
3 – <i>neutral</i>	31.4 (44)
2 – <i>disagree</i>	11.4 (16)
1 – <i>strongly disagree</i>	2.1 (3)

technology PD offerings and their levels of subsequent use of technology (see Table 1). Respondents rated their agreement to the following items:

1. I have had adequate training in technology use.
2. After participating in existing technology PD opportunities, I feel prepared to integrate technology.

Overall, participants responded positively regarding effectiveness of technology PD: 80 (57.9%) respondents *agreed* or *strongly agreed* they had experienced adequate training in technology use (mode = 4, *agree*). Positive responses were also evident in the 77 (55%) respondents who *agreed* or *strongly agreed* they felt prepared to integrate technology as a result of their participation in technology PD (mode = 4, *agree*). Similar numbers of participants chose *neutral* for their technology use training and feeling prepared for subsequent technology integration following PD participation: 41 (29.3%) and 44 (31.4%) respondents, respectively.

Table 2
Teacher Perceptions of Existing School Culture (N=140)

Item	% (n)
My administration encourages me to integrate technology in the classroom.	
5 – <i>strongly agree</i>	25 (35)
4 - <i>agree</i>	27.9 (39)
3 - <i>neutral</i>	27.1 (38)
2 - <i>disagree</i>	15.7 (22)
1 – <i>strongly disagree</i>	4.3 (6)
My administration supports the integration of technology in our school.	
5 – <i>strongly agree</i>	24.3 (34)
4 - <i>agree</i>	32.1 (45)
3 - <i>neutral</i>	28.6 (40)
2 - <i>disagree</i>	11.4 (16)
1 – <i>strongly disagree</i>	3.6 (5)
My administration models best practices for technology use.	
5 – <i>strongly agree</i>	5 (7)
4 - <i>agree</i>	18.5 (26)
3 - <i>neutral</i>	22.9 (32)
2 - <i>disagree</i>	25 (35)
1 – <i>strongly disagree</i>	28.6 (40)
Teachers and administrators work together to develop technology integration expectations.	
5 – <i>strongly agree</i>	2.1 (3)
4 - <i>agree</i>	12.9 (18)
3 - <i>neutral</i>	25 (35)
2 - <i>disagree</i>	36.4 (51)
1 – <i>strongly disagree</i>	23.6 (33)
The school culture in our building supports technology integration efforts.	
5 – <i>strongly agree</i>	17.1 (24)
4 - <i>agree</i>	32.1 (45)
3 - <i>neutral</i>	22.9 (32)
2 - <i>disagree</i>	17.9 (25)
1 – <i>strongly disagree</i>	10 (14)

The second research question sought to understand teachers' perceptions of administration and school culture as it relates to instructional technology integration (see Table 2). Respondents rated their agreement to the following items:

1. My administration encourages me to integrate technology in the classroom.
2. My administration supports the integration of technology in our school.
3. My administration models best practices for technology use.

4. Teachers and administrators work together to develop technology integration expectations.
5. The school culture in our building supports technology integration efforts.

More than half of the respondents agreed or strongly agreed (52.9%) that administration encouraged them to integrate technology in the classroom and agreed or strongly agreed (56.4%) that the school administration supported technology integration within the school (modes = 4, agree). These somewhat positive responses shifted when teachers were asked whether administrators modeled best practices for technology use, with 53.6% disagreeing or strongly disagreeing and 60% disagreeing or strongly disagreeing that administrators and teachers work together to develop technology integration expectations (modes = 2, disagree). Finally, responses were divided when participants were asked if the culture of the school supported technology integration efforts: 49.2% of teachers agreed or strongly agreed while 22.9% selected neutral and 27.9% selected disagreed or strongly disagreed (mode = 4, agree).

Conclusions and Implications

This study was limited by the sample and context, which limit generalizability. This study focused on teachers in a single comprehensive high school within a technology-rich school district and did not include the perceptions of administrators. The study did not include qualitative data, which could improve the understanding of teachers' perceptions of technology integration.

The findings support teachers' desire and need for several of the design features of effective PD programs: content focused,

active learning, collaboration, use of models and modeling, coaching and expert support feedback and reflection, and sustained duration (Darling-Hammond, Hylar, & Gardner, 2017). Teachers in this context expressed interest in having technology-focused PD that included collaboration and use of models and modeling.

"Time to learn, time to plan, time to collaborate with other teachers" is necessary for technology implementation (Wachira & Keengwe, 2011, p. 23). The collaborative nature of learning is supported by Standard C of the Tennessee Instructional Leadership Standards (TNDOE, 2015). Additionally, technology PD should provide more opportunities for active participation and consider the different ways in which individuals learn (e.g., collaboratively or as part of a community of learners; Jones & Dexter, 2014). Topper and Lancaster (2013) argue that unless teachers are provided with technology PD that incorporates time and opportunity to explore and learn how to integrate technology, improved student achievement is unlikely to result. Even with abundant technology PD offerings, however, teachers may struggle to successfully integrate technology if they do not feel that their administration and school culture is supportive of technology use (Jones & Dexter, 2014).

School leadership can influence school culture, and school culture can in turn influence teachers' use of technology (Li & Choi, 2014; Perrotta, 2013). Specifically, school leadership, paired with a positive school culture that includes opportunities for teacher collaboration, (Şahin, 2011) can play an important part in supporting innovative actions (Perrotta, 2013). The findings of this study may suggest a level of teacher discontent with the administration in the study context, as respondents noted that

administrators and teachers did not work together to develop technology integration expectations. Şahin (2011) emphasizes the importance of school leaders taking proactive steps to consciously develop opportunities for mutual teacher cooperation as a method for establishing a productive school culture.

When leadership does not support and model innovation, school culture can decline and teachers may be less likely to take initiative (McKinney et al., 2015). The Tennessee Instructional Leadership (TNDOE, 2015) Standard B indicates that school leaders should model and communicate expectations to support shared

ownership and success. Study participants also noted that administrators did not model best practices for technology use. As the technology integration specialist, the first author was aware that the 19 high school administrators had numerous opportunities to model technology, collaborate, and demonstrate best practices during faculty and instructional council meetings, and by participating in technology PD. However, few administrators took advantage of these opportunities. Therefore, a follow-up study should investigate the supports and barriers of technology use, including collaborative practices, by school leaders.

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Facilitating Teacher Learning Through Leading: An Elementary Mathematics Coach's Story

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Elementary mathematics coaches are increasingly prevalent as school leaders, given the high stakes accountability of state and national initiatives. Coaches provide instructional support to teachers in a variety of ways in an effort to improve the teaching and learning of mathematics and help teachers navigate changing standards, curriculum, and expectations. The purpose of this article is to share one elementary mathematics coach's story of facilitating teacher learning through a book study. This sustained and intentional approach yielded positive teacher growth and change due to the purposeful decisions of the elementary mathematics coach.

Elementary mathematics coaches are tasked with the expectation of improving the teaching and learning of mathematics through intentional supports to address teachers' knowledge, instructional choices, and behaviors (Campbell & Malkus, 2013). There has been a noticeable increase in elementary mathematics coaches employed by schools and districts within the last two decades to meet the needs of high stakes accountability, new curriculum, and new standards (McGatha & Rigelman, 2017). New state standards, like the Common Core Standards for Mathematics (CCSSM; Common Core State Standards Initiative [CCSSI], 2010) and different states' variations of CCSSM placed new demands on teachers, demands for which they were not adequately prepared (National Council of Teachers of Mathematics [NCTM], 2014; Swars & Chestnutt, 2016). Teachers are expected to teach mathematics in ways that they did not experience in their own schooling and are asked to use methods that are vastly different from their expectations and knowledge (Swars & Chestnutt, 2016). Elementary teachers need support and professional learning to fill the gap between the new expectations and their current

knowledge (Loucks-Horsley, Stiles, Mundry, Love, & Hewson, 2010; NCTM, 2014).

The lecture model of professional development is inadequate in producing teacher change (Darling-Hammond, Hyler, & Gardner, 2017; Desimone & Garet, 2015). In order for professional development to produce positive instructional change, the learning experience must have an element of on-going support from leaders, like coaches (Darling-Hammond, Hyler, & Gardner, 2017), so teachers have time to process the new learning. Another element of effective professional development is providing teachers the opportunity to process their learning with colleagues (Darling-Hammond, Hyler, & Gardner, 2017). Some have labeled this type of professional development as "teacher study groups" (Arbaugh, 2003; Crespo, 2006). The purpose of this paper is to share one elementary mathematics coach's story leading teacher learning through a derivative of a teacher study group model.

Context

The elementary mathematics coach was assigned to one Title One elementary school in a rural area outside of a large, urban

U.S. city. The school serves more than 450 students whose ethnicities were 72% Caucasian, 18% Hispanic, 8% African American, and 2% Asian. The school had a C rating (with A being the highest) from the state according to student performance on state assessments. The school's academic focus for the year was to improve mathematics achievement. The elementary mathematics coach supported the teachers in a variety of methods that included: coaching cycles, traditional professional development sessions, consulting in professional learning communities, and finding resources and materials for instruction. The coach's training included a graduate course about mentoring and coaching, Cognitive Coaching (Costa & Garmston, 2002) certification, and on-going professional development from the district office. All 22 teachers were invited to participate in the collaborative study. Despite multiple attempts to increase participation, one third grade teacher, and two fourth grade teachers volunteered ($N = 3$). All participants had more than five years teaching experience and had only taught at this particular elementary school.

Leveraging Coaching Techniques to Design Professional Development

The elementary mathematics coach relied heavily on her Cognitive Coaching training and her experiences with facilitating reflective conversations. Cognitive Coaching is an objective (i.e., non-judgmental) mediation exercise that includes leading three types of conversations with teachers: planning, reflecting, and or problem-solving (Costa & Garmston, 2002). The leader (in this case the elementary mathematics coach) uses paraphrasing and questioning techniques to assist the teacher in self-evaluation, growth, and decision making (Costa & Garmston, 2002). With knowledge of best practices in professional

development, the elementary mathematics coach identified the need to go deeper with mathematics content as a result from coaching cycle conversations with the teachers. These conversations took place after coach observed lessons. It became apparent that the teachers needed more than the district provided mathematics trainings. The teachers needed to dissect their understanding of mathematical concepts.

The elementary mathematics coach designed a book study using Lipping Ma's (1999) book, *Knowing and Teaching Elementary Mathematics* as the foundation for a Cognitive Coaching-driven experience. Ma's (1999) work centered around comparing the mathematics knowledge of elementary teachers in America and China. This book was selected because it provided the opportunity for examining both content and pedagogy. The elementary mathematics coach included the following data collection elements in order to document teacher learning: pre-assessment, blog entries, conversations, and end of study reflections. The pre-assessment consisted of the same four mathematics tasks (see Appendix 1) that were used in Ma's study (1999). These tasks provided a baseline for the teachers' knowledge of concepts and procedures, and identified areas that could be targeted for growth and deeper conversation. Once teachers consented, they were given the Ma (1999) text and schedule of readings (see Table 1). A blog was established for teachers to communicate with the elementary mathematics coach and each other as they read each chapter as an additional element of reflection and an on-going, sustained opportunity for effective professional development through questions and problem solving. There were no set prompts for the blog other than chapter headings to ensure an open invitation to react, respond, and reflect. The elementary mathematics coach did not

want to bias or influence the learning with scripted prompts. Blog entries were expected to be posted prior to the monthly meeting as was the scheduled readings.

Table 1

Timeline for Liping Ma Book Study

Month	Individual Tasks	Book Study Group
December	Invitation to participate and pre-assessment e-mailed to participants	
January	Chapter 1 & 2 Blog	After school meeting 4:30-6:00
February	Chapter 3 Blog	After school meeting 4:30-6:00
March	Chapter 4 Blog	After school meeting 4:30-6:00
March	Chapter 5 Blog	After school meeting 4:30-6:00
April	Chapter 6 & 7 Blog	After school meeting 4:30-6:00

The format for the book study hour and a half discussion was not specifically structured to align with the Cognitive Coaching techniques. The coach did write some informal questions in preparation to use if needed. For example: *What did you think about the task and the difference between teachers' thinking? What made you think that? What presented in the chapter is different from your practice or current thinking? What is something that stood out to you?* Depending on the teachers' responses, the coach could probe for specifics, make connections between the participants, and provide continued support for learning. The coach also planned learning activities based on the pre-assessment data and requests.

Analysis

Because of this unique professional development, the elementary mathematics coach wanted to document and analyze the results of this experience in order to share the impact accurately with the principal and district officials; the coach used qualitative research practices for the analysis. After each meeting, the elementary mathematics coach reviewed the notes and/ or recordings and wrote summaries in order to capture the session's focus and the teachers' perspectives, reflections, and learning. Recordings of each session were also transcribed by the coach to ensure accuracy in the meaning of the conversations and to identify themes through coding. The participants proofed the written summaries to ensure validity as a member check. Summaries, blog entries, and end-of-study reflections were also coded for themes. To systemically organize these themes, the work of Anfara, Brown, and Mangione (2002) was considered in which the three iterations of analysis are summarized. The mathematics coach started with (1) initial codes that emerged from the data, (2) grouping of pattern variables, and (3) analyzing the culmination of variables in the final matrix. Table 2 outlines the major findings derived from the pre-assessment, the dialogue, the blog, and the final reflection.

Pre-assessment Results

The teachers completed the pre-assessment prior to the first discussion allowing for the mathematics coach to anticipate and plan to support misconceptions of these concepts. All three teachers emphasized the need for students to have a strong grasp of place value knowledge when responding to the first task about subtraction. [Coach's note: Address the definition of subtraction; compare different strategies.]

All three teachers handled the multiplication problem by recognizing the student error and providing a more conceptual approach with partial products or using expanded form. The teachers' language included "*break apart*" or use place value to solve three problems (see Figure 1). One misconception held by the teacher was noted in the second response is that zero is a placeholder. [Coach's note here: Address misconception of zero being a place holder; Plan for teachers to compare a variety of multiplication strategies to look for relationships. Work on precision of language with the strategies.]

As expected from the results of Ma's study (1999), the teachers struggled with the division of fraction task. Teacher two provided no response. Teacher one provided an incorrect answer. The third teacher provided a story problem without a solution. "*I had $1\frac{3}{4}$ pizza and they ate $\frac{1}{2}$ of what I had before. How much pizza did I have originally?*" [Coach's note here: Bring manipulatives to explore the meaning of the operation with meaningful contexts. Compare the three types of models for division of fractions.]

Facilitating Conversations During the Book Study Sessions

The first meeting's focus was to build rapport and discuss the subtraction task. The teachers were excited to discuss this task and make connections to their instruction and faculty meeting topics. They were well aware of various strategies to help students subtract. The term *decompose* became a major focus as the teachers had never heard this term. One teacher said she was going to start using the word *decompose* with students instead of the less precise and inappropriate (Karp, Bush, & Dougherty, 2014) but commonly used term

borrowing. The teachers all referred to their curriculum program and the resources within that first session; this reference provided multiple strategies for solving subtraction problems.

Another meeting combined the readings around multiplication and the division of fractions task with the bulk of the discussion around fractions due to the preassessment. There was much frustration with the teaching of fractions. In the discussion, one teacher said, "*I do wrongly associate with dividing something in half with splitting it between two.*" Another teacher agreed, "*I do not think I was adequately prepared to teach fractions for understanding.*" They requested resources and demonstrations of instructional strategies such as a division with common denominators from the coach to be part of future meetings. On the last session, the teachers concluded that the Chinese teachers knew multiple ways to teach concepts, and they taught the "why" behind procedures. They said that the Chinese students seemed to naturally have that expectation to communicate clearly about mathematical ideas.

Outcomes from Coaching Conversations

Cognitive Coaching methods are grounded in the use of mediation to support self-directed growth or learning (Costa & Garmston, 2002). The use of the blog provided on-going opportunities for teacher reflection and documentation of connections and development. The culminating reflections were an important for the teachers to communicate the sustaining ideas from the experience. The elementary mathematics coach organized the teacher reflections around the teacher learning, their reaction to Ma (1999), and recommendations for teacher preparation and teacher support (see Table 3).

Table 2

Matrix of Findings and Sources for Data Triangulation

Major finding	Source of data			
	Pre-Assessment	Discussion	Blog	Reflection
Priorities in teaching	x			
Misconceptions	x	x		
New learning		x		x
Environment of change		x	x	x

Table 3

Teacher Reflections

Question Topic	Teacher One	Teacher Two	Teacher Three
Teacher Learning	This book has reinforced strengths & weaknesses. I have learned I was emphasizing product more than process	No response	I learned that I'm on the right track to teaching the how & why, but that I have room to grow – I need to focus on the terminology I use and clarify the expectations I give kids.
Change in Teaching	I will emphasize children showing process & making connections w/ real world problems. I am still working on fractions.	I will try to stress and be more intentional in teaching a variety of strategies and tell the students why.	The first change I'll make is to decompose the numbers with addition and subtraction.
Reaction	I wonder if this is an effect of having to cover so much information? Also, American teachers may have been misrepresented. There continue to be strong and weak teachers everywhere.	It makes me wonder about the teacher preparation classes.	It's scary and embarrassing- I'd hope that we could become better math teachers so our students can compete internationally.
Recommendations	More time in teacher training on helping teachers take time to have children explain. I think the standards revision will help.	Teach more/ variety of strategies to future teachers and younger students.	Intentional teaching and national professional development, resources, and standards that could also be competitive globally too – learn from others.

Discussion

Two elements of this project are important to discuss: the teacher learning and the leadership of the elementary mathematics coach. Mediating conversations was a critical component of facilitating a professional learning environment like a book study.

Teacher Learning

The subtraction task and corresponding reading revealed that the teachers were comfortable with a variety of strategies, but were limited in effective terminology (e.g., decomposing) to align with conceptual practices. Also, the teachers used the “take away” definition of subtraction versus talking about subtraction in terms of finding the difference either by “taking away” or “comparing.” In terms of the multiplication task, once again teachers were flexible in the possibilities of a variety of strategies like the lattice model or partial products. However, a misconception was still revealed in that “zero holds places” instead of conceptually understanding that the zeros are an indication of how many units in a particular position. The teachers had limited conceptual knowledge of division of fractions and were at best only able to state the algorithm. They were uneasy about the content and admitted not knowing how to approach the topic. The teachers did wonder if having a research-based curriculum helped them with their knowledge of strategies for subtraction and multiplication. Their discussions advocated for change in teacher preparation and professional development, and they had the initiative to seek out other sources for information and analyzed their curriculum materials as a result. They wanted additional time to focus on student thinking and sought additional strategies to effectively teach these concepts. The teachers also met with the principal to request time to dissect the school curriculum. Most importantly,

these teachers called for additional professional development for their entire faculty.

The Coach’s Careful Planning

The elementary mathematics coach designed a unique professional learning opportunity to influence instructional change. Allowing teachers to voluntarily participate ensured an element of buy-in to new ideas and learning which is sometimes missing for required faculty-wide professional training. The timing of this coaching experience occurred simultaneously with the adoption of the CCSSM (CCSSI, 2010) in this state. While the principal supported this endeavor, it was not until the teachers contacted her about what they were learning that faculty meeting agendas were altered to include the teachers sharing their new learning and analyzing their current curriculum materials. The principal also gave them credit for their time in the form of professional development hours (This state requires teachers to have 24 hours of professional development each year.) after hearing and seeing the shift in learning.

The work of coaches is often ill-defined and hard to capture accurately. The results of this learning experience have to be attributed to the mediation of the coach. This coach had the necessary training which allowed her to carefully use paraphrasing and questioning techniques to support meaningful learning. Part of this process for the coach is to resist sharing her thoughts about the conversation and instead listen, paraphrase, and push with questioning techniques to prompt the teachers to make decisions. As a certified Cognitive Coach, she relied on that training to assess the thinking of the teacher participants to ask intentional questions to dig deeper in reflection (Costa & Garmston, 2002). The elementary mathematics coach also

empowered the teacher participants to engage in conversations with the principal instead of doing it herself.

Her training also contributed to the intentional planning of the five-month long book study with elements that supported teacher learning including: book selection, voluntary participation, sustained learning experiences, and the elementary mathematics coach's facilitation skills. The coach collected pre-assessment data to provide a foundation for targeted learning and planned support for difficult concepts.

Implications

Teachers need more support and meaningful opportunities to discuss mathematics concepts and procedures, and to plan and problem solve to strengthen their knowledge and instructional practice with the support of a trained mathematics coach (Campbell & Malkus, 2013). Their leadership responsibilities are diverse making it hard to define exactly the necessary actions that they need to make to instigate instructional change. This story provides evidence of some necessary actions. First, the creation of an optional learning experience provided an invitation for learning verses a requirement for learning. Teachers became empowered from the experience and initiated curriculum analysis and faculty meeting changes catalyzed from the coach led discussions. Second, the non-judgmental elements created a safe space for teachers to be vulnerable, admit misconceptions, question their background knowledge, and be open for new learning. Teachers had a relationship with each other and the elementary mathematics coach. Being in a group with support and rapport, set the stage to brainstorm, problem solve, and learn. The elementary mathematics coach was able to mediate these discussions because of her

training and leadership ability. If we are to expect coaches to make a difference, then professional learning and training has to be a priority.

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Appendix 1

Liping Ma's (1999) Tasks

Number	Task
	Look at these problems:
	$\begin{array}{r} 52 \\ -25 \\ \hline \end{array}$ $\begin{array}{r} 91 \\ -79 \\ \hline \end{array}$
1	<p>How would you approach these problems if you were teaching second grade? What big ideas would you say pupils would need to understand or be able to do before they could start learning subtraction with regrouping? What key ideas would you need to highlight?</p> <p>Some sixth-grade teachers noticed that several of their students were making the same mistake in multiplying large numbers.</p>
	$\begin{array}{r} 123 \\ \times 645 \\ \hline 615 \\ 492 \\ 738 \\ \hline 184 \end{array}$
2	<p>In trying to calculate the students seemed to be forgetting to “move the numbers” (i.e., the partial products) over on each line.</p> <p>They were doing this:</p> $\begin{array}{r} 123 \\ \times 645 \\ \hline 615 \\ 492 \\ 738 \\ \hline 184 \end{array}$ <p>Instead of this:</p> $\begin{array}{r} 123 \\ \times 645 \\ \hline 615 \\ 492 \\ 738 \\ \hline 79,335 \end{array}$ <p>While these teachers agreed this was a problem, they did not agree on what to do about it. What would you do if you were teaching sixth grade and you noticed that several of your students were doing this?</p>
3	<p>People seem to have different approaches to solving problems involving division with fractions. How do you solve a problem like this one?</p> $1\frac{3}{4} \div \frac{1}{2} =$ <p>Imagine that you are teaching division with fractions. To make this meaningful for kids, something that many teachers try to do is relate mathematics to real world settings. Sometimes they try to come up with real-world situations or story-problems to show the application of some particular piece of content. What would you say would be a good story or problem for $1\frac{3}{4} \div \frac{1}{2} = ?$</p>
4	<p>Imagine that one of your students comes to class very excited. She tells you that she has figured out a theory that you never told the class. She explains that she has discovered that as the perimeter of a closed figure increases, the area also increases. She shows you this picture to prove what she is doing:</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>4 cm</p> <p>4cm</p>  </div> <div style="text-align: center;"> <p>8 cm</p> <p>4 cm</p>  </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;"> <p>Perimeter: 16 cm</p> <p>Area: 16 square cm</p> </div> <div style="text-align: center;"> <p>Perimeter: 24 cm</p> <p>Area: 32 square cm</p> </div> </div> <p>How would you respond to this student?</p>

Challenges and Barriers to Success as Experienced by One International Graduate Student within the Biological, Psychosocial, and Academic Contexts during the Initial Acculturation Process

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Particular challenges facing international students include: culture shock, adapting to new teaching/learning environments, understanding the American higher education system and U.S. social norms, adapting to food, climate, legal systems, as well dealing with feelings of homesickness and isolation. This acculturation (cross-cultural transition) process presents psychosocial, biological, and academic challenges and barriers to success that require adaptation. In addition to receiving correct and updated information, international students require professors and university personnel willing to be prepared not only academically but also socially and culturally to meet their needs. The article identifies challenges and potential barriers to success facing one international graduate student during the initial transition process.

International students' enrollment in higher education in the U.S. has expanded considerably in the last decades and has significantly increased during the last few years. Between the academic years 2011 – 2016 this population increased by 278,894. In 2016 the International Student population was 1,043,839. This international student population growth and its net financial contribution have resulted in significant economic growth for the U.S. (Institute of International Education, 2016). Within 2013-2014 academic year the economic benefit that International Students and their families brought to the U.S. was equivalent to \$26.8 billion. Meanwhile, the supported number of jobs that these two populations brought to the country corresponded to 340,000 within the same period. State universities have found that increased enrollment of international students contributes directly to the success of higher educational systems and their regional

economies (NAFSA: Association of International Educators, 2014).

A multicultural approach by faculty and staff towards these international students is necessary within the higher education system in order to maintain a symbiotic relationship for both students and university personnel and to produce a long-term positive impact on society. Nowadays, the maintenance of good international affairs has become essential for different organizational systems since the world has become globalized as a result of technological advancements and treaties between different communities and countries. Specifically, understanding of international communities and their interactions, the process of adaptation, and their contributions to the common welfare, in this case, to the U.S. society, has become essential and fundamental. The understanding of these items within the higher education system is crucial since higher education is the open

door leading to the formation of the world's future contemporary leaders.

The first semester of college in the United States is an exciting time for international students and for all those involved with working with these students, but there are specific challenges and / or obstacles that naturally arise and may contribute to substantial levels of stress during the initial transition process. Wu, Garza, and Guzman (2015) identify specific challenges facing international students as they deal with the acculturation (cross-cultural transition) process as requiring psychological, sociocultural, and physical / biological adaptation which may be positive or negative. Specifically, students experience (in varying degrees) culture shock regarding adapting to new teaching and learning environments, understanding the American higher education system, understanding U.S. social norms, and adapting to food, climate, legal systems, as well as experiencing feelings of homesickness and isolation (Ibid, 2015). International students require professors and university personnel who are willing to go the extra mile for them and be prepared not only academically but also socially and culturally to meet the needs of these students during this most crucial initial cross-cultural transition time. As a result, supporting faculty and university personnel should consider the major challenges facing international students as well as what is refreshing about working with these special students and expand supportive measure and increase resources to ensure a positive cultural and academic experience.

Methodology

Because of the nature of the inquiry, the investigator took a qualitative stance in examining the responses of an international

graduate student regarding challenges or barriers to success that emerged during the acculturation (cross-cultural transition) process over the first semester at Middle Tennessee State University. The qualitative study was structured using a set of overarching questions which served as a framework to be responded to by the participant within the personal journal format (Craig, 2009). The personal journal format encourages depth of reflective discourse and is a form of personal reflection, thought, and reaction that differs from face-to-face interaction and provides an opportunity for sharing personal thoughts and ideas in an authentic and non-threatening format (Corbin & Strauss, 2015). As a result, examination and categorization of the reflective journal entries allowed themes and patterns of meaning to emerge and be identified by the investigator. These findings are reported in a thick narrative that provides descriptive, interpretive accounts of the naturally-occurring acculturation experiences of the international student during the first semester of cross-cultural transition (Bogdan & Biklen, 2007; Corbin & Strauss, 2015; Craig, 2009; Craig & Young, 2009; Young, 1994).

Questions included:

1. As an international graduate student at Middle Tennessee State University, what would you identify as some of the major challenges or barriers to your success in the biological context that occurred during the first semester of study?
2. As an international graduate student at Middle Tennessee State University, what would you identify as some of the major challenges or barriers to your success in the psychosocial context that occurred during the first semester of study?
3. As an international graduate student at Middle Tennessee State University, what would you identify as some of the major challenges or barriers to your success in

the academic context that occurred during the first semester of study?

4. As an international graduate student at Middle Tennessee State University, what are some strategies for success you have used to overcome these challenges or barriers to your success that occurred during the first semester of study?

Findings

Analysis and categorization of reflective journal entries revealed that the international graduate student experienced a plethora of challenges and barriers to success during the initial cross-cultural transition experience. Three general themes or categories of meaning emerged which included specific difficulties and challenges with adaptation during this initial phase of cross-cultural transition within (1) the biological context (refers to all factors that alter the regular biological process of a human being), (2) the psychosocial context (refers to psychological aspects and sociological aspects), and within (3) the academic context (refers all classroom experiences involving learning).

Specific journal entries follow that illustrate the difficulties and barriers to success that faced the international graduate student during the biological context, the psychosocial context, and the academic context during the initial cross-cultural transition experience.

Biological Context Challenges / Barriers to Success

Journal entries regarding challenges to success in the biological context included difficulties with adaptation to a new climate and time zone, feelings of exhaustion and dehydration, and cultural differences regarding eating habits. The most comprehensive reflective journal entries

pertaining to major challenges or barriers to success in the biological context are the following:

During my first month since my arrival to the U.S. I started experiencing extreme feelings of exhaustion, as I arrived to TN during winter season. My biological clock has always been used to all year-round summer. It was quite a shock to find out that daylight in TN only lasted nine hours. Days during this holiday season in Murfreesboro starts at 7a.m. with the first sunrise, and are limited at 4 p.m. by twilight, which announces the arrival of darkness that consumes the city's energy. (Journal Entry, January 18, 2017)

My body's dehydration due to constant extreme climate changes, was, and still is a critical point for my physiological adjustment to this country. The sudden change from a light wardrobe to a heavy one is awful. I would've thought that it would've been better if I'd had a gradual physiological transition. Ideally starting from the summer. (Journal Entry, January 17, 2017)

Adjustment to new set of eating habits played a fundamental part of my physiological adaptation to the U.S. Quantification of the serving portions in this nation and kind of food prepared are extremely distinctive from Colombia's. In this country serving portions are much lighter during lunch and heavier during dinner (Journal Entry, January 19, 2017)

Psychosocial Context Challenges / Barriers to Success

Journal entries pertaining to cultural differences resulting in major challenges or

barriers to success in the psychosocial context focused on pace and rhythm of the American way of life, feelings of isolation and emotional distress, lack of social inclusion, and difficulty with communication in the social context:

I've always thought Americans had a rapid pace of living, this is, from what I've previously observed in the media, and the goal driven behavior of my sponsor's family (as they tend to accomplish everything days before hand). But the reality is that pace of living in the U.S. is extremely fast. In this land, everything is detailed and synchronized. Most of the activities in this country are on the go. Now, I get why there's a drive thru in every corner. Americans time management is very precise. When a meeting or a date is settled, people expect you to arrive 10-15 minutes prior to the appointment. Being exactly on time is late.

(Journal Entry, January 22, 2017)

Journal entries such as the following, "The constant fluctuation of emotions during the first two months, the feelings of social isolation that comes within the abrupt emerging into a new culture, and the emotional fatigue, were some of the Psychological experiences that were, and still are challenging for my adjustment as an International student" reflected emotional stress. (Journal Entry, March 28, 2017).

Journal entries made during the first two months of stay were especially detailed regarding this emotional distress and feeling of isolation due to separation from family and friends, difficulties resulting from lack of social inclusion due to age and cultural differences as well as understanding of common sayings and slang:

My emotions during the first period of time in the States fluctuated from one extreme to another. I was really excited about getting to know another culture, and traditions. I was excited about singing Christmas carols, getting a real Christmas tree, having a Christmas eve dinner, things that I've grown fond from previous observations during my short vacationing trips to this country, and Hallmark movies. On the other hand, I felt devastated when I pictured my family in Colombia spending quality time together during holidays. (Journal Entry, January 28, 2017)

I began to feel social isolated after the first couple of weeks from the arrival to the U.S., especially, after the holidays. As a result of my inability of meeting new people, I took refuge on prolonged Colombian telephone/video calls with friends via Skype or WhatsApp. I spent most of my days before school started, watching movies on Netflix, and talking to the only supporting network I'd ever known. My room became a cave, a shelter, a refuge from a new culture that terrified me to get to know. Going out to meet people was far away from my comfort zone. (Journal Entry, February 5, 2017)

As days go by I feel I have less time to communicate with family and friends in Colombia. I've started to come up with the necessity of relating to new people. I've tried talking to classmates from school, but they seem careless about making new friends. People my age are usually engaged, married with kids, or going thru a divorce.

I've been feeling frustrated at times for not being able to communicate my thoughts, and beliefs at a fast pace, especially when it involves the explanation of complicated things. Not understanding slang and common sayings makes things worst, especially when I know that I can give much more intellectually and emotionally during conversations. (Journal Entry, February 7, 2017)

One journal entry made at a later date was especially poignant:

At the end of the week I was invited for coffee by one of the girls that I'd previously met in networking meetings held in Nashville. She'd asked me to help her expand her Spanish lexicon. I was excited with the idea of making a new friend. After meeting her I realized the intentions of this woman were not genuine. All she wanted was sell cosmetic products. (Journal Entry, April 7, 2017)

Academic Context Challenges / Barriers to Success

With regard to major challenges or barriers to success in the academic context specific to MTSU, journal entries noted confusion, fatigue, and a need for more supportive guidance and specific advisement than what was provided by the International Affairs Center with regard to the amount of required paperwork and monetary expenses associated with acquiring international health-care insurance and a social security number, filling out I-20 and I-94 immigration forms, understanding and completing a pre-contract and final contract, acquiring a state driver's license, paying and understanding campus and special installation fees, understanding the physical layout of the

university campus and its many buildings as well as its parking requirements, second language issues involving lack of understanding and difficulty communicating within the academic discipline of study, problems resulting from lack of experience within the virtual classroom environment (online classes) utilized in MTSU's Master in Business Administration program of study, and difficulties arising from navigation of MTSU's online site including completion of the online registration process for enrollment in courses.

As a result, journal entries described extreme anxiousness and resulting stress:

This is practically the last week of the first term from the Master's program. Everything has been squished in for this week, since promptly there's going to be a Spring Break. I hardly think there's time for getting things done. On Friday, I went again to the Social Security Office. It amazes me the number of things I've to do before getting settled in this region. I feel like I've been going back and forth the whole time between Payroll, Human resources, and the social security office. Just in the Social Security office I had to wait for about three hours to get attended. (Journal Entry, February 20, 2017)

In addition to the time management challenges and resulting stress mentioned in the preceding journal entries, there was also an entry describing illness:

With all the stress, I got a Cold. I had a strong head ache, and throat inflammation. There was no one to take care of me. This is the moment when you start missing your family the most. I stayed almost the whole weekend in bed. Couldn't get much homework done. It's very difficult to

handle all of this commotion with climate changes. As days goes by it gets cooler and cooler. My body and mind feel exhausted. (Journal Entry, February 10, 2017)

Numerous journal entries described difficulties with achievement and frustration within the academic context due to second language issues involving communication, reading, writing, and comprehension compounded by lack of experience within the virtual classroom environment and unfamiliarity with navigation and format of D2L online and hybrid courses required in the MTSU Master in Business Administration degree program. In addition, the D2L specific course email versus MT regular email, navigation of the MTSU RaiderNet website involving online registration, online access for the library, and online payment of expenses and fees were confusing, stressful, and frustrating as detailed:

Grades from the first accelerated courses of the MBA were uploaded. It was for my amaze to find out that I made an average grade on my digital class, when I knew that I've completed assignments on time. I decided to e-mail the professor and ask him about it, but he didn't respond about eight days afterwards (when courses were closed). I feel very upset, frustrated that he scored me zero on this part of the assignments after all the hard work I invested on this class. Communication within online classes is a true barrier. (Journal Entry, March 16, 2017)

Journal entries for March, 2017, and April, 2017, reflected increasing anxiety, frustration, and feelings of helplessness and lack of

support with regard to the academic context. The following Journal Entry dated April, 11, 2017, is the most detailed:

Yesterday was one of the hardest days of my second academic term. Everything that made me anxious from last week and the beginning of this week exploded. Last week was just a terrible week. I felt like every academic activity was squished in all together. I had to turn in projects, assignments, and take two test and one quiz in a row. Two of them which were held on the same day. Academic pressure has become overwhelming. I feel tense, like carrying a bag full of rocks that's pulling me down to the center of the earth every time a want to give a step forward. I barely got four hours of sleeping between nights. Coffee has become my best friend, my catalyzer.

Days seemed long, and prolonged. I spent two nights with my accounting study group studying for a midterm exam. I felt frustrated most of the week trying to keep up with specific vocabulary words for school's lectures. Practically most of the time I feel I'm expressing myself like high school student, and not like a grad student who has the information to build and give a well-spoken argument.

I'm becoming more and more anxious trying to understand school's online courses. They hold a completely different approach for my education. Trying to keep up with more than one online course at the same time is just excessive with my language struggle, and more when professor's does not

comprehend that my language issue is not the same as having an issue understanding the course's content. Short limited time of nearly 50 seconds per question to approach an online evaluation is nearly impossible to make an outstanding grade in a second language. It takes me at least twice as much time just to comprehend what is being asked. This situation is very frustrating.

A Journal Entry dated April 12, 2017, contained a list of suggested strategies used to meet the challenges and barriers leading to success that emerged during the initial phase of the acculturation (cross-cultural transition) process that required psychological, sociocultural, and physical / biological adaptation:

1. Get organized, get an agenda schedule, do everything beforehand.
2. Go to tutoring.
3. Bring lunch to school.
4. Seek friends (American).
5. Get close to people from same ethnic community, give support.
6. Drink at least three bottle of water per day, use warm clothes, hydrate skin constantly, have a big breakfast.
7. Exercise at least twice of week, get a good night's sleep.
8. Talk about problems, seek help.
9. Get involved in after school activities.
10. Set at least one goal per week.
11. Read a lot, employ new words in every written paper and conversation.
12. Work out problems as they occur, one at a time.

Conclusions - Implications – Limitations

Using qualitative research methods, this study explored one international graduate student's challenges and barriers to success within the biological, psychosocial, and academic contexts that emerged over the course of the first semester of study at MTSU. The findings indicated that this international graduate student faced a series of significant transitional difficulties during the first semester of graduate study in the United States at MTSU in the biological, psychosocial, and academic contexts. The student's reflective journal entries expressed feelings of frustration and experiencing a lack of support and / or resources provided by university personal and professors in all three contexts. Although the student was able to develop new strategies to deal with these cross-cultural transitional challenges, a need for more support and additional resources provided by university personnel and professors was indicated by the student during this most crucial acculturation time. Since the international student begins the cross-cultural transition process at the university, it makes sense that the university should focus on challenges faced by the international student and provide more adequate support for the international student during the initial phase of cross-cultural transition.

Although limited to one international graduate student at one university, these findings based on the human experience of one international student emphasize the need for future studies in this most important area to ensure that universities have a better understanding of the needs of international students in order to more effectively provide support and resources so that these students are not left with the feelings expressed in this Reflective Journal Entry made near the end of the first semester of study:

This term I've taken three of the most difficult classes: finance, accounting, and information systems. Vocabulary has become more technical. I've been investing lots of time re-learning business terms in English. It has become harder to understand these lectures in a rapid way. Specially, when most of the work is being held online, and timed. New academic vocabulary in English increases timing practically four time—more times of reading, and understanding, while sleeping time shortens in an inverse proportional way.

It's frustrating when you ask for support from a faculty member, and they immediately assume that you should know everything or respond the following: "an average student should be able to solve it blindfolded". Asking questions or for support just makes me feel as if I was committing a sin. This, diminishes my self-esteem; it makes me feel as if I didn't own the knowledge necessary to work out a problem.

I thought the whole purpose of the university was learning, but is kind of hard when you think that if you make a comment or ask a question about anything you're going to be judge immediately, and make a fool of yourself. Some of the faculty responses to a question usually end up with recommendations such as "ask a friend" or "try group study".

As a new international student making new friends it's not easy, even if you try it most of the time you'll get responses as "I'm busy" or people would barely accept to meet only when it's extremely necessary. It's demotivating sometimes go to

school due to these reasons. (Journal Entry, April 14, 2017)

Although data collected in this study cannot be generalized to a larger population, findings do indicate that future studies should follow focusing on international students and the challenges and barriers to success facing international students attending United States' universities. Furthermore, the biological and psychosocial contexts, in addition to the academic context, should be considered in order to be better prepared to meet the needs of international students not only academically but also socially and culturally.

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