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## Curricular Reform in Schools: Secondary Leaders' Perceptions

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### Abstract

*The landscape of PK–12 education is dynamic, constantly adapting to meet the needs and demands for student learning. These changes inspire curricular reforms, and such processes compound the complexity of leadership roles within PK–12 education settings. This study explored the nature and extent of transformational leadership practices and efficacy beliefs exhibited by secondary school leaders as they implement a mathematics curricular reform. In addition, the study examined the barriers of curricular reform processes as perceived by school leaders. This study employed a phenomenological methodology as participants were asked to describe their lived experiences within the context of the mathematics curricular reform. Semi-structured interviews and focus groups were used for data collection, allowing participants to share stories and examples that captured the essence of their lived experiences. The research findings suggest efficacy beliefs related to relationships and experience influence leaders' transformational leadership practices as they facilitate curricular reforms in their schools. Furthermore, these transformational leadership practices may be used to address and overcome barriers throughout the implementation of curricular reforms.*

### Introduction

Change is constantly reshaping the landscape of PK–12 education settings as standards, technology, and instructional design adjust to meet the needs and demands for student learning. In response to changing content standards over the past ten years, states across the nation implemented policies demanding greater standardization and accountability measures to monitor student achievement (Hollingworth et al., 2017; Leone et al., 2009; Yongmei et al., 2018). These changes in content, standardization, and accountability also led to shifts in pedagogy and instructional design. Ultimately, these changing demands inspire curricular reforms and consequently compound the complexity of leadership roles in PK–12 education.

While there are numerous studies examining teachers' perceptions with regards to curricular reforms, there is little known about school leaders' beliefs, perceptions, and experiences throughout such change processes (Donohoo, 2018; Dupas, 2016; Flood & Angelle, 2017; Schreiner, 2014). This phenomenological study presented an opportunity to address this gap in the literature and capture the experiences and perceptions of school leaders as they implemented a mathematics curricular reform (Creswell & Poth, 2018; Moustakas, 1994). Within the context of PK–12 schools in this study, leadership roles included principals, assistant principals, deans, and teacher leaders as they influenced instructional and curricular goals throughout the implementation of a curricular reform.

The transformational leadership approach outlines how school leaders may engage teachers, motivating and nurturing them through the curriculum change process (Northouse, 2016). It is through this reciprocal relationship that school leaders encourage growth and development among teachers. Furthermore, the transformational leadership approach requires school leaders to be cognizant of their own beliefs and behaviors in relation to the needs of teachers as they guide curricular change (Northouse, 2016). Bandura (1993) defines this as one's efficacy beliefs, or their personal perceptions regarding their own abilities. These efficacy beliefs influence how leaders may "feel, think, motivate themselves, and behave" within the scope of a curricular reform (Bandura, 1993, p. 118). Although several studies examine the transformational leadership approach in education (Hauserman & Stick, 2013; Leithwood & Sun, 2012; Leone et al., 2009; Pietsch & Tulowitzki, 2017), few, if any, studies explore the inter-relationship between efficacy beliefs and transformational leadership practices.

### **Purpose of the Study**

The purpose of this phenomenological study was to inform leadership beliefs and practices of secondary education leaders as they prepare for and implement mathematics reforms in their schools. This study explored the roles and beliefs of secondary school leaders during a mathematics curricular reform, as well as uncovering their perceptions of barriers to the curricular reform process. Transformational leadership provided the theoretical framework for the study, anchoring the research in leadership factors that describe "how leaders can initiate, develop, and carry out significant changes in organizations" (Northouse, 2016, p. 175). Given the qualitative methodology, the purpose was not to examine the success of the curricular reform, rather, this study explored leaders' efficacy beliefs as an integral component of transformational leadership within the context of curricular reform processes.

### **Research Questions**

This study strived to illuminate the role and practice of secondary leaders in guiding curriculum reforms. To gather insight into the role of secondary education leaders during the implementation of a new mathematics curriculum, this study was directed by the following research questions:

1. How do secondary school leaders exhibit transformational leadership practices during a curricular reform?
2. What are the barriers of a curricular reform as perceived by secondary school leaders?
3. How do secondary school leaders' perceived efficacy beliefs influence the nature and extent of their role during a curricular reform?

### **Theoretical Framework**

This phenomenological study was situated within the framework of transformational leadership. Transformational leadership is defined by the relationship between leaders and followers (Northouse, 2016). Bernard M. Bass propelled the idea of transformational leadership by developing a model through which leaders motivate followers to accomplish goals that benefit the group rather than the individual (1985, 2000). The model identified four factors which affect a leader's ability to transform the thinking and actions of followers: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass, 1985; Northouse, 2016). Kouzes and Posner (2017) further identified the need for leaders to be honest, competent, inspiring, and forward-thinking to drive transformational change. These factors cultivate the relationship between leaders and followers as they approach change within their organization (Kouzes & Posner, 2017; Northouse, 2016).

Central to the transformational leadership approach is both leaders' and followers' self-concepts (Bass, 2000; Northouse, 2016). One's self-concept is influenced by their efficacy beliefs. Bandura (1989, 1993) asserted self-efficacy beliefs are determined through motivational, cognitive, affective, and selection processes. These processes lead individuals to exercise human agency as they set goals and anticipate outcomes (Bandura, 1989). Efficacy beliefs, then, are complementary to the transformational leadership approach when studying the lived experiences of school leaders implementing a curricular reform.

## *Review of the Literature*

### **Transformational Leadership and Leading Change**

Leaders in education are tasked with guiding many forms of complex change, thus requiring them to become transformational change agents that support their school communities in being flexible and adaptable to such changes (Bass, 2000). Transformational leadership operates through the relationship between leaders and followers (Bass, 1997; Kouzes & Posner, 2017; Leithwood & Sun,

2012; Minckler, 2014; Northouse, 2016). Through their leadership practice and behaviors, transformational leaders build connections to engage and motivate followers to work towards organizational goals (Leithwood & Sun, 2012; Minckler, 2014; Northouse, 2016). Thus, Northouse (2016) claims the transformational leadership approach “requires that leaders become social architects” within their organizations (p. 176). Leaders enact transformational approaches as they construct the culture and community of their organization through the relationships they build with and among their followers (Leithwood & Sun, 2012; Minckler, 2014). Within educational settings, transformational leaders shape school culture as they communicate a shared vision, foster collaboration, and build trust (Kouzes & Posner, 2017; Leithwood & Sun, 2012; Minckler, 2014). In addition, one of the key roles of school leaders is to act as a change agent (Leone et al., 2009), motivating growth and transformation as they build the capacity of teachers’ instructional practices (Pietsch & Tulowitzki, 2017). Frost and Harris (2003) extend these practices to all leadership roles within the context of school settings, asserting interpersonal skills and relationships ultimately determine the extent to which leaders, including teacher leaders, influence the beliefs and practice of their colleagues.

### **Shared Leadership**

Leithwood (2016) supports a synergistic leadership model that harnesses the power of all leadership roles, claiming this approach is stronger than individual leadership roles or when leadership roles are missing. School organizations are shifting from the typical model of formal leadership authority to a collegial model predicated on teamwork and relationships among both assigned and emergent leadership roles (Harris, 2005; Leithwood, 2016). Connected school leadership establishes coherence within the organization (Brondyk et al., 2015), promoting balanced decision-making processes and interdependence among school leaders and staff (Harris, 2005; Yongmei et al., 2018). These interdependent structures foster trust and leadership beyond assigned roles within the school organization (Flood & Angelle, 2017). Furthermore, leaders that form supportive, connected school systems engage and motivate staff to embrace changes, such as curricular reforms, aligning to the vision and direction of the organization (Bass, 2000; Brondyk et al., 2015; Kezar, 2018; Leithwood et al., 2007).

### **Efficacy**

Bandura (1993) asserts “efficacy beliefs influence how people feel, think, motivate themselves, and behave” (p. 118).

He further established the role of efficacy beliefs within learning organizations by developing the constructs of teacher efficacy and collective efficacy (1993). Several researchers emphasize the leader’s influence on teacher and collective efficacy beliefs of staff within their school settings (Bandura, 1993; Dupas, 2016; Flood & Angelle, 2017; Goddard & Goddard, 2001; Kitsantas & Ware, 2011; Minckler, 2014).

However, Burns (1978) highlights leadership efficacy, emphasizing the role of the transformational, self-efficacious leader in developing an environment where learning and innovation flourish. Leadership efficacies are described as the knowledge, skills, and abilities of leaders to address and overcome challenges, thus contributing to the leader’s effectiveness in creating a culture that inspires others to do the same (Dupas, 2016; Dyson, 2019).

### **Curricular Reforms**

The momentum and excitement of implementing new curricular methods and materials to benefit student achievement can be used to establish a culture that welcomes change and growth in schools (Valencic-Miller, 2017). This culture is largely dependent on how school leaders implement change, and this in turn impacts the transition school staff make in taking ownership of the new initiative (Valencic-Miller, 2017).

### **ADMINISTRATORS AND CURRICULAR REFORMS**

Effective school leaders use their knowledge of the school’s culture when planning for and implementing change in their buildings (Hollingworth et al., 2017). Moreover, school administrators recognize the magnitude of change and the degree of disequilibrium the reform may cause among staff members (Miller et al., 2016). Curricular reforms often require adjustments to organizational and instructional paradigms that are deeply rooted in the culture of the school (Miller et al., 2016). For such complex change processes, a balanced and coordinated system of leadership roles and styles are necessary to influence the culture and commitment to change in the school (Pietsch & Tulowitzki, 2017).

One key role of school administrators is that of a change agent, setting the direction for continuous school improvement (Leone et al., 2009). The foundation of this role rests in the administrator’s ability to gain the trust of school staff and to empower teachers to grow and embrace change (Hollingworth et al., 2017; Leone et al., 2009;

Schreiner, 2014). Administrators cultivate trust as they allow teachers to have reasonable autonomy through the change process (Hollingworth et al., 2017; Schreiner, 2014), which in turn encourages educators to take risks and be innovative in their teaching practice (Leone et al., 2009). Furthermore, administrators recognize the strengths of staff members and their past accomplishments, utilizing these teachers' expertise to drive the implementation of reforms (Hollingworth et al., 2017; Schreiner, 2014). Reform is a delicate balance for school leaders, but a clear vision and collaborative goals give meaning to the curricular work and contribute to the implementation of the reform (Barnes & Toncheff, 2016; Leone et al., 2009; Rogers, 2003; Schreiner, 2014).

Administrators cite several sources of information and leadership practices that contribute to their ability to implement successful curricular reforms. McIntosh et al. (2016) reports administrators are more supportive of new initiatives after obtaining further knowledge, thus recommending training opportunities for administrators. Once administrative leaders understand the potential benefits of the curricular reform, Glatthorn et al. (2012) and Yoon (2016) suggest leaders use data to influence teacher buy-in. Leaders also report the importance of engaging in explicit and purposeful conversations with teaching staff (Hollingworth et al., 2017), emphasizing the need to be a good listener and valuing teacher voice throughout the change process (Valencic-Miller, 2017). Finally, effective school leaders provide opportunities for staff development, both formal and informal, to support teachers' abilities in utilizing the curriculum (Glatthorn et al., 2012). Staff development is especially critical during the implementation stage of curricular change as this is when the context is built for introducing new methods and materials to improve current courses (Glatthorn et al., 2012).

### **SECONDARY TEACHERS AND CURRICULAR REFORMS**

All teachers can lead change, including curricular reforms, whether from a positional or emergent leadership role (Frost & Harris, 2003). Teacher leaders are commonly defined as those that influence colleagues with regards to content knowledge and instructional pedagogy (Frost & Harris, 2003). An individual's teaching capacity and authority is influenced by their knowledge of the content and instructional practices, their interpersonal skills, and the situational context and culture of the school (Frost & Harris, 2003). In turn, the school's context and culture

are shaped by the extent to which administrators support teacher leadership (Brondyk et al., 2015; Glatthorn et al., 2012). Thus, school administrators play a key role in developing the efficacy beliefs of staff members and fostering teacher leadership (Donohoo, 2018; Yoon, 2016).

Curricular reforms in secondary settings take place at department levels and new initiatives may challenge the identity and culture of the department (Sutton & Knuth, 2020). The departmental culture is developed and maintained by teacher leaders in the department, which Sutton and Knuth (2020) found influences how individual teachers interpret, adopt, and implement new initiatives. Several researchers echo this finding, citing teacher change agents position themselves in relation to their peers (Kunnari et al., 2018; Leander & Osborne, 2008; Lukacs, 2015). Teacher leaders guide change processes as they elicit the participation of their colleagues (Lukacs, 2015) and respond to the voices of their peers (Leander & Osborne, 2008). These practices generate buy-in and shared responsibility among departmental staff members, in turn motivating teachers to vary their pedagogical approaches and embrace reform efforts (Kunnari et al., 2018; Lukacs, 2015). Furthermore, teachers express relief in knowing they have some autonomy when implementing reforms (Glatthorn et al., 2012; Schreiner, 2014; Turnbull, 2002; Valencic-Miller, 2017) and they are more likely to implement and sustain reform efforts when they receive training, resources, and support from developers and administrators (Glatthorn et al., 2012; Turnbull, 2002). Schreiner (2014) recommends school leaders, including teacher leaders, support teachers in finding their passion within the reform, suggesting this helps teachers develop a positive disposition towards change and to avoid taking change personally.

### **BARRIERS TO CURRICULAR REFORMS**

Rogers (2003) refers to the individuals that present barriers and resistance to change processes as the late majority and laggards. Curricular reforms often result in a sense of loss for these individuals which creates barriers to the change process (Schreiner, 2014; Zimmerman, 2006). Teachers may perceive their current assets and skills will become obsolete with the transition to new initiatives (Schreiner, 2014), leading them to feel threatened and therefore resisting the change (Zimmerman, 2006). In addition, teachers often resist change due to timing, both in terms of several changes being introduced concurrently and limited time to collaborate and implement change

(Lukacs, 2015; Schreiner, 2014). Moreover, teachers develop a lack of trust in school leaders and resign from change processes when continual change occurs (Schreiner, 2014).

Knight (2009) suggests “if school leaders understand the nature of resistance, they can improve relationships with teachers and increase teacher implementation of proven practices” (p. 508). Overcoming resistance, then, begins with communication and trust among school leaders and staff (Knight, 2009; Venezia, 2015; Zimmerman, 2006) and Powell and Kusuma-Powell (2015) believe transformational learning needs to occur for change to be implemented. Transformational learning demands individuals analyze their assumptions and the implications of these assumptions, which is followed by cognitive reframing of the proposed reform through modeling and support (Powell & Kusuma-Powell, 2015). Effective school leaders support transformational learning as they recognize the professional expertise of staff members and honor teacher voice through the change process (Knight, 2009; Venezia, 2015; Zimmerman, 2006). These practices increase trusting relationships between school leaders and staff (Knight, 2009), thus allowing for transformational leadership and transformational learning through the curricular reform process.

### **Leadership in Mathematics**

Over the past 10 years, the goals and instructional pedagogy of mathematics shifted from an emphasis on traditional procedural knowledge to conceptual reasoning and understanding within real-world contexts (Hopkins et al., 2017; National Council of Teachers of Mathematics, 2014; Spillane et al., 2018). States responded to these changes by instituting greater standardization and accountability measures (Hollingworth et al., 2017; Leone et al., 2009; Martinez & Amick, 2019; Yongmei et al., 2018). With the increasing emphasis on school effectiveness and standardized testing, Martinez and Amick (2019) claim the role of school leaders also shifted from managerial tasks to include instructional leadership focused on curriculum and pedagogy. This new role required school leaders to acknowledge and support changes in instructional pedagogy from traditional, direct instruction methods to innovative, inquiry methodologies focused on mathematical reasoning (Martinez & Amick, 2019).

### **LEADERSHIP EFFICACY IN MATHEMATICS**

Bennet et al. (2015) and Lochmiller and Acker-Hocevar (2016) expanded upon the complexity of formal leadership roles given leaders’ expertise may not be in mathematics

content. School leaders with expertise in mathematics support teachers by offering guidance related to mathematical content, mathematical discourse in the classroom, and math-specific instructional pedagogies (Trinter & Carlson-Jaquez, 2018). Conversely, Lochmiller and Acker-Hocevar (2016) reported “principals perceived that their own lack of understanding about math . . . content prevented them from engaging classroom teachers about instructional improvement matters directly” (p. 283). Given this perception, school leaders without mathematical expertise reframe their instructional leadership role in ways that do not require deep understanding of mathematical content (Lochmiller & Acker-Hocevar, 2016; Trinter & Carlson-Jaquez, 2018). These leaders rely on managerial aspects of instructional leadership, such as establishing and supporting departmental structures for collaboration, hiring teachers that display the desired instructional practice, and providing professional learning from outside consultants (Lochmiller & Acker-Hocevar, 2016). Furthermore, these school leaders often provide deductive feedback to teachers, focusing on general instructional practices and classroom management (Trinter & Carlson-Jaquez, 2018).

However, Martinez and Amick (2019) found teachers rely on instructional support from on-site school leaders, emphasizing the need for leaders to develop skills and understandings in various content areas to complete evaluations and provide feedback to teachers (Trinter & Carlson-Jaquez, 2018). Research suggests targeted professional development for school administrators can strengthen leaders’ mathematical content knowledge and pedagogy (Martinez & Amick, 2019) and increase their ability to notice students’ mathematical thinking and reasoning when conducting observations and evaluations (Bennet et al., 2015). When such professional learning opportunities are not available, Trinter and Carlson-Jaquez (2018) recommend school leaders seek out colleagues with expertise in mathematics and include these individuals as observers when appropriate. These opportunities for school leaders to grow professionally in specific content areas are critical given the importance and value teachers place on content-focused feedback (Martinez & Amick, 2019; Trinter & Carlson-Jaquez, 2018).

### **LEADERSHIP IN MATHEMATICAL REFORMS**

It is important for school leaders to provide guidance for reform efforts by first developing an understanding of the culture and history of mathematics instruction in their schools (Eacott & Homes, 2010). The mathematics culture

is defined by a shared vision and philosophical beliefs, which are often observed through pedagogical practices deeply rooted in the history of traditional mathematics (Eacott & Homes, 2010). Barnes and Toncheff (2016) suggest leaders establish a mathematics leadership team to evaluate the current vision for mathematics instruction and to collaborate in forming a new vision “that honors the mathematics program’s current realities and fuels program improvement” (p. 27). Once the vision is established, it is critical to maintain the math leadership team as the guiding coalition for mathematical reforms (Barnes & Toncheff, 2016; Kotter, 2012).

Administrative school leaders often approach mathematics instruction and reform through organizational structures when their background is not in mathematics (Hopkins et al., 2017; Spillane et al., 2018). For example, district and school administrators intentionally select individuals as informal leaders to serve as a bridge when implementing reforms in mathematics (Hopkins et al., 2017; Spillane et al., 2018). Teachers and staff members serve as informal leaders as they facilitate professional dialogue and collaboration to support the development of instructional practices in mathematics (Barnes & Toncheff, 2016; Chapman et al., 2013). Thus, leaders leverage organizational structures and collaborative teams to reform mathematical pedagogies embedded within the school’s culture (Barnes & Toncheff, 2016; Hopkins et al., 2017).

### Summary

PK–12 schools are faced with an unprecedented number of changes, often requiring school leaders to act as transformational change agents as they influence the attitudes, beliefs, and behaviors of school staff (Bass, 2000). As Burns (1978) suggests, the demands of such complex change “requires that we consider the totality of decision-making by leaders at all levels and in all the interstices of the polity” (p. 415). Thus, this phenomenological study sought to capture the experiences of secondary school leaders across different hierarchical levels as they navigated the complexities of a curricular reform process in mathematics.

## Methodology

This study was guided by a transcendental phenomenological research design, the primary purpose of which is to capture the universal essence of a phenomenon (Creswell & Poth, 2018). Transcendental phenomenology offered an

opportunity to capture the essence of secondary education leaders’ experiences while engaging in a mathematics curricular reform process. Semi-structured interviews and focus groups were used to collect the lived experiences of the participants. Moustakas’ (1994) explicit approach to transcendental phenomenology provided an outline for analyzing and synthesizing data, leading to the identification of threaded themes which formed the unified description of the study’s findings.

### Context

The setting for this study was a large, urban school district in a rural Midwestern state. Secondary schools in the district included middle schools, serving approximately 3,000 students in 6th–8th grades, and high schools, serving approximately 4,000 students in 9th–12th grades. In the 2019–2020 school year, the mathematics departments in the secondary schools moved through the curriculum adoption process. The new math curriculum was implemented within all middle and high schools during the 2020–2021 school year. Thus, mathematics and secondary schools provided the context for this study in examining leadership practices and beliefs during the implementation of a curricular reform.

### Participants

The common phenomenon in this study was the mathematics curricular reform, but additional qualifying criteria were used to identify participants that offered insights into the research questions outlined for the purpose of this study (Creswell & Poth, 2018; Moustakas, 1994). Those individuals meeting the criteria and consenting to participation were selected and interviewed. All participants partaking in the interview process were invited to participate in a focus group aligned to their leadership role. As noted, participants held different leadership roles and these roles were integral in the study’s data analysis. Table 1 displays the participants’ profiles.

### Data Collection

Potential participants were emailed to invite them to participate in this research study. The email detailed the purpose and nature of the study, described the expectations for participation, and provided the informed consent form as an attachment. Data was collected from consenting participants through one-on-one, semi-structured interviews. The Individual Interview Protocol (Appendix A) provided an outline of questions aligned to the study’s research questions and additional questions were asked to prompt



Table 1: Participant Profiles

Name	Leadership Role	Profile
Colin	Teacher	<b>Context:</b> High school classroom teacher <b>Background:</b> Bachelor's in math, science, and physics education <b>Courses Currently Taught:</b> Geometry, Probability and Statistics, and Transition to College Math <b># Years in Current Role:</b> 6 years
Cassandra	Teacher	<b>Context:</b> High school classroom teacher <b>Background:</b> Bachelor's in math; Master's in education with an emphasis in mathematics <b>Courses Currently Taught:</b> Algebra 2 and Precalculus <b># Years in Current Role:</b> 7 years
Andrew	Teacher	<b>Context:</b> High school classroom teacher <b>Background:</b> Bachelor's in marketing; master's in business administration; Teaching certification in secondary mathematics <b>Courses Currently Taught:</b> Algebra 1 and Bridge to High School Mathematics <b># Years in Current Role:</b> 10 years
Chris	Teacher	<b>Context:</b> Middle school classroom teacher <b>Background:</b> Bachelor's in math and science education <b>Courses Currently Taught:</b> 6th grade <b># Years in Current Role:</b> 6 years
Victor	Teacher	<b>Context:</b> High school special education teacher <b>Background:</b> Bachelor's in engineering; teaching certification in mathematics; Master's in curriculum and instruction; Specialist degree in educational administration <b>Courses Currently Taught:</b> High school special education <b># Years in Current Role:</b> 9 years
Micah	Dean	<b>Context:</b> Middle school dean <b>Background:</b> Bachelor's in physical education, health, and biology; Master's in administration <b># Years in Current Role:</b> 2 years
Natalie	Dean	<b>Context:</b> High school dean <b>Background:</b> Bachelor's in history education; master's in leadership and administration <b># Years in Current Role:</b> 1 year
Tamaya	Assistant Principal	<b>Context:</b> Middle school assistant principal <b>Background:</b> Bachelor's in social studies and English education; Doctorate in educational administration <b># Years in Current Role:</b> 2 years
Dan	Assistant Principal	<b>Context:</b> High school assistant principal <b>Background:</b> Bachelor's in secondary social sciences education; Master's in school administration <b># Years in Current Role:</b> 9 years
Kelly	Principal	<b>Context:</b> Middle school principal <b>Background:</b> Bachelor's in elementary education and special education; Master's in administration and special education administration <b># Years in Current Role:</b> 5 years
John	Principal	<b>Context:</b> High school principal <b>Background:</b> Bachelor's in elementary education and secondary social studies education; Master's in administration <b># Years in Current Role:</b> 15 years

for clarity as needed. In addition, focus group sessions were held aligned to the following leadership roles: principals, deans and assistant principals, and teachers. The Focus Group Protocol (Appendix B) prompted participants to review the unified description compiled from the individual interviews and engage in a dialogue about their experience within the curricular reform process.

### Data Analysis

The transcendental phenomenological data analysis methods outlined by Moustakas (1994) guided the analysis within this study. Moustakas (1994) details four phases in the data analysis process: transcription, horizontalization, textural and structural descriptions, and unified description. Recordings were transcribed by a digital service and the researchers reviewed the transcriptions a minimum of three times. Meaning statements were analyzed and coded into themes aligned to the research questions guiding the study. The coded themes were used to develop rich textural and structural descriptions of the study's findings. These descriptions were synthesized into a unified description and shared with the focus groups as a method of peer debriefing. Focus group participants reviewed the unified description, adding further clarity and expounding upon their experiences. They also discussed the similarities and differences among the leadership roles. The researchers used the focus group transcriptions to elaborate upon the themes detailed in the unified description. In addition, the focus group participants provided recommendations for future curricular reform processes and this was added as a concluding theme within the unified description. The resulting unified description provided the findings of this study.

## Findings

The study's emerging themes were identified in relation to the study's research questions. Nine themes surfaced from the individual interviews and focus groups during the data analysis process. In addition, focus groups addressed recommendations for future curricular reforms and this is presented as a concluding theme.

### TRANSFORMATIONAL LEADERSHIP

Participants were asked to consider and reflect upon how they exhibited transformational leadership practices during the mathematics curricular reform through guiding questions. Through these practices transformational leaders build relationships that stimulate followers' self-worth and motivation (Bass, 1997; Leithwood & Sun, 2012;

Minckler, 2014), which in turn influences followers to accomplish more and to move beyond their own self-interests for the good of the organization (Northouse, 2016). Four themes related to transformational leadership practices emerged through the data analysis process: culture and collaboration, shared leadership, motivation and innovation, and supportive considerations. These transformational leadership themes were further divided into sub-themes given the lived experiences described by the study's participants. Table 2 displays the themes and sub-themes related to transformational leadership practices.

**Culture and Collaboration.** As leaders in the study elaborated on their experience through the implementation of the curricular reform, several leaders, especially teacher leaders, alluded to the importance of culture and collaboration. Five sub-themes emerged regarding leaders' roles in establishing the culture and collaborative practices within their schools.

**District Information.** Two teacher leaders in the study explained the importance of sharing information from district committees with colleagues at their schools. *Andrew* described his role as an "information disseminator," stating, "There are some conversations that happen that don't involve everyone, and I try to make sure that everyone is on the same page and is given that information." Teacher leaders in this study fostered connections with colleagues and communicated organizational goals throughout the curricular reform process by sharing information between district level committees and their individual schools.

**Visibility and Modeling.** Participants from all leadership roles indicated visibility and modeling were important transformational leadership practices throughout the mathematics reform as these factors impacted the culture and collaboration within their schools and math departments. *Colin* explained, "I guess just making sure that I'm visible, that my colleagues who I know are doing great things are visible." He expanded upon this comment detailing how he develops resources and emphasizes important components of the curriculum by "spreading the word." *Tamaya*, an assistant principal, offered similar insights from an administrative perspective, stating, "We really work as a team, but we also ask our teachers to work as a team, so we have to model that."

**Sharing Information and Resources.** Many teacher participants articulated they acted as role models to promote

Table 2: Transformational Leadership: Themes and Sub-Themes

Research Question	Themes	Sub-Themes
How do secondary school leaders exhibit transformational leadership practices during a curricular reform?	Culture and Collaboration	District Information Visibility and Modeling Sharing Information and Resources Lead Learner Hiring and Placement
	Shared Leadership	Non-Hierarchical Trust Empowering Leaders Fostering Teacher Leadership
	Motivation and Innovation	Instructional Expectations Implementation Expectations Modeling Innovation Flexibility Honesty
	Supportive Considerations	Listening and Responding Offering Support

culture and collaboration in their schools by sharing information and resources. *Andrew* explained, “I try to share everything that I’m making and try to get the others included.” Teacher leaders also commented on their practice of engaging in frequent, informal dialogue with colleagues. This practice involved sharing successes and challenges when implementing the new math curriculum. Other teachers referred to an “open-door” culture in which they felt comfortable seeking out advice and help from their fellow colleagues that furthered the implementation process. *Cassandra* detailed, “Our department works so well together that I don’t feel like it’s something my leadership role has had to play a part in, we just kind of built that relationship with each other.” Culture and collaboration were established prior to the curricular reform process in this study, but the role of leaders was to continue fostering such elements within their school settings by sharing information and resources.

**Lead Learner.** Conversely, an assistant principal and principals in the study explained how they fostered culture and collaboration by being lead learners and learning alongside the teachers. *Tamaya* described her philosophy, stating, “I think being lead learners is number one...Because we expect our teachers to [engage in learning], it’s only appro-

priate that we would do it.” Based on the practices articulated by administrators, it is important for administrators to be lead learners and learn about the content and curriculum being implemented when engaged in a reform in their school settings. This, in turn, encouraged teachers to grow and learn through the process as well.

**Hiring and Placement.** Participants commented on the importance of hiring staff that would align with the culture of the school and placing staff in leadership roles that would drive the curricular reform process. *Cassandra* shared how hiring new staff transformed the math department at her school, stating, “We became the majority, the people who wanted to collaborate, we slowly became the majority...With every new hire, they just saw that was the expectation.” *Kelly*, a principal, also described her role in selecting teacher leaders to guide the reform, explaining, “With the rollout of math, I really felt like we had everybody in the places they needed to be.” Hiring and placing teachers in various roles proved to be a key practice in transforming school cultures, but also in implementing the curricular reform in math.

**Shared Leadership.** Shared leadership emerged as a theme as mathematics teachers were viewed as the experts

to guide the curricular reform. John, a principal, stated, “Math teachers are math majors... of course we would want them to be the primary decision makers on what curriculum we should adopt. And I think that’s important too because it also holds them accountable for results.” The sub-themes of shared leadership were: non-hierarchical structures, trust, empowering leaders, and fostering teacher leadership.

**Non-Hierarchical Structures.** Several participants referred to the non-hierarchical structures within their schools, implying a shared leadership system was in place. Teacher leaders expressed they did not view their leadership role as being different than their colleagues. *Cassandra* shared, “I don’t see myself as in any different role than anybody else in my [course] group for instance.” *Chris* communicated a similar perception of the structures at his school, stating, “I feel like we don’t really have leaders here because it just kind of seems like we all just collaborate, like this is what we do.” One of the deans, *Natalie*, explained how she believed administrators in her building helped minimize the perception of a hierarchy, noting, “It’s not the hierarchy of we’re in charge, we’re the admin so we make the decisions... I like to view it as a roundtable, where everybody has the time, and everybody respects everybody’s communication.” These perceptions reflect shared leadership structures rather than a positional hierarchy, which in turn influenced the collaboration and communication throughout the curricular reform process.

**Trust.** Trust was only mentioned by the administrative participants as they communicated this was key to their role as transformational leaders. *Tamaya* and *Tom* described their need to trust in the teacher leaders serving on district committees to communicate and guide the curriculum implementation within their schools. *Tom* stated, “My biggest role is to trust the people that are on those committees and in those leadership roles to make those suggestions.” Within the context of this study, such trust was utilized to promote teacher leadership.

**Empowering Leaders.** Deans, assistant principals, and principals stressed that empowering teacher leaders was a key practice they engaged in as transformational leaders. *Dan* claimed, “That is the most important thing we can do, is make people feel valued, feel like they’re giving a large contribution.” *Kelly* expanded on how she empowered an instructional coach to be a leader for the math teachers, explaining, “I’m providing her that support and the leader-

ship opportunities...It’s really empowering her to be able to do her job.” John, a principal, suggested this transformational leadership practice also fosters accountability to move the reform process forward. He explained, “I think the more we invest in that leadership aspect in our buildings, the more people take ownership and responsibility.”

**Fostering Teacher Leadership.** Fostering teacher leadership was expressed only by those in administrative roles. Administrative participants articulated that transformational leaders needed to foster teacher leadership when cultivating shared leadership structures in their buildings. *Dan* shared, “As far as teachers, we know who our teacher leaders are. We want to foster their growth just as much as we possibly can.” *Dan* and *Tom* described how teachers valued their colleagues as experts in the field and as a result, added a measure of accountability. Thus, one of the key practices of administrative, transformational leaders in this study was to foster the leadership capacities and roles of teachers in their buildings.

**Motivation and Innovation.** The study’s participants shared several ways in which they addressed motivation and innovation throughout the implementation of the curricular reform. These practices organized into five sub-themes: instructional expectations, implementation expectations, modeling innovation, flexibility, and honesty.

**Instructional Expectations.** Teacher leaders communicated their primary practice related to motivating their colleagues centered around emphasizing instructional expectations. *Colin* explained how he continually stressed pedagogy and the expectations associated with best practices, stating, “I’m always kind of making sure to kind of push that narrative of are we doing what’s right, are we making the right decisions, making the right choices.” Other teacher leaders shared the importance of having similar goals and pacing related to student learning. *Cassandra* explained how these expectations fostered collaboration, sharing, “I think having the structure and the expectation that we deliver the same material at a similar time has really helped because it does force you to collaborate, because now guess what, you’re teaching the same thing.”

**Implementation Expectations.** The administrative participants conveyed that their leadership role associated with motivation focused on maintaining the expectations regarding the implementation of the curriculum. *Tamaya* shared her experience in communicating the implementation

expectations with teachers, explaining, “But sometimes you also have to stay firm and say we’re doing it...I know it’s hard, but the benefits are here, and then explain the why, explain the benefits, explain how it’s going to help kids.” In addition, *Tamaya* and *Tom* referred to the importance of actionable steps throughout the curricular reform process, emphasizing that the expectations for implementation be put into action within classroom settings.

**Modeling Innovation.** Participants perceived they encouraged innovation through modeling their own willingness to change and try new things. Furthermore, the teacher leaders described how they were transparent and willing to share what was and was not successful given changes in their instructional practices related to the implementation of the new math curriculum. *Andrew* stated, “Trying something for the first time sometimes can be intimidating, so knowing someone else has tried it...can help them feel like they can try something.” *Tom*, a principal, articulated his practice of providing teachers opportunities to observe other teachers to foster innovation. Modeling innovation and risk-taking were transformational leadership practices utilized by participants to encourage similar behaviors in their fellow colleagues.

**Flexibility.** Several participants commented on the need to convey to teachers that there was flexibility in implementing the new math curriculum. Participants stressed that teachers need to understand the curriculum materials can be adapted to meet their instructional needs and, more importantly, the needs of their students. *Dan* and *Tom*, both administrators, explained how they reminded teachers that while the “what” is taught may not be in their control, the “how” content is taught is something they can adjust within their teaching practice.

In addition, two principals explained how flexible scheduling influenced innovative teaching practices, although in two different manners. *John* described how common planning was necessary for teachers to explore new methodologies, stating, “We can’t tell people to invest in each other and help each other be better teachers and share instructional strategies if we don’t give them the time to do it.” *Kelly*, on the other hand, explained how block scheduling created opportunities for innovation in the classroom setting. These principals believed scheduling was a practice they could utilize to provide opportunities for innovation.

**Honesty.** A dean, assistant principal, and principal acknowledged their role in providing honesty during the curricular reform to further inspire innovative teaching practices. *Natalie* shared, “Understanding yes, it’s something new, it’s nerve-wracking. You don’t know what the outcomes are because we’ve been in a certain curriculum for so long.” Administrators believed acknowledging teachers’ fears and reservations throughout the reform process allowed for transparency and encouraged teachers to adjust their current beliefs and practices for the good of the organization.

**Supportive Considerations.** Participants in the study communicated practices in which they offered support to teachers engaged in the curricular reform process. These supportive elements fell into two sub-themes: listening and responding and offering support.

**Listening and Responding.** Listening and responding were practices heavily referenced by administrative leaders in the study. Only one teacher leader referred to listening and responding as a method of support and he spoke in terms of his assistant principal’s practice rather than his own leadership practice. *Andrew* emphasized how valuable such support was from his assistant principal, explaining, “With my assistant principal, when he asks me about how things are going, I know that at least it’s on his mind. So, I know that if I need to approach him, I know that he’s thinking about it.” *Tom*, a principal, echoed the importance of listening and responding when leading change, stating, “I learned that you can initiate it, but if you don’t provide the support, it defaults right back to what the comfort was, we close the door, we do what we were always comfortable with.”

Administrators in the study perceived they engaged in transformational leadership practices when they responded by providing the necessary support and guidance to move the implementation of the curricular reform process forward. *Kelly*, a principal, articulated her philosophy in supporting teachers throughout the implementation process, explaining, “Teachers are worried about what their performance is going to be. And I have approached all of that...as this is an opportunity. You’re not going to fail at this because it’s my job to support you, and if you are unsuccessful then I’m not doing my job.” Additionally, administrative leaders commented on their role in listening and responding to the personal and emotional needs of teachers, stressing the importance of considering the

mindsets of the teachers throughout the curricular reform. Administrators played a key role as they listened and responded to teachers throughout the curriculum implementation, offering teachers reassurance that they would be successful through the reform process.

**Offering Support.** The study’s participants articulated diverse ways in which they offered support to teachers throughout the implementation of the new curriculum. Teacher leaders described how they extended invitations for support to their colleagues. *Chris* stated, “We just let them know we can help them out if they need it.” *Colin* echoed this practice, further sharing how he provides support to his peers by offering reassurance when they voice concerns or questions. These comments suggested teacher leaders most often invited others to come to them for help when needed but that they rarely sought out teachers to provide individualized support.

On the other hand, administrative leaders emphasized how they sought out teachers to offer support as a key practice in their role as transformational leaders. *Dan* explained:

I believe it’s my job to get out of this room as often as I can and go see people teach and go watch kids learn. That’s the only way I can figure out what’s going on. If I wait for people to come to this door, that is such a tiny little funnel...and that’s not appropriate. I need to go out to them.

Furthermore, *Dan*, *John*, and *Natalie* indicated that the teachers needing help are often the one’s most reluctant to ask for help, thus stressing the need to seek out these teachers. Administrators also noted their practice in providing feedback to teachers as an element of offering support. *Tamaya* described her role in providing feedback to teachers as a method of moving instructional practices forward. Feedback was a powerful tool for these administrators to offer support to teachers within and beyond the scope of the curricular reform.

**BARRIERS**

Participants were asked to describe the barriers they perceived existed throughout the implementation of the curricular reform. Through the data analysis process, three themes emerged: physical barriers, social barriers, and leadership barriers. These barriers are further divided into sub-themes given the lived experiences detailed by the study’s participants. Table 3 displays the themes and sub-themes related to the barriers of the curricular reform.

**Physical Barriers.** Physical barriers are defined as objects or structures that may occlude the educational environment. Teacher leaders in the study overwhelmingly noted more physical barriers than deans, assistant principals, or principals. An assistant principal and principal both commented that they “can’t think of any” physical barriers. The physical barriers that were described through the data collection process fell into the following sub-themes: pandemic, time, planning, technology, and policies and proximity.

Table 3: Barriers of the Curricular Reform: Themes and Sub-Themes

Research Question	Themes	Sub-Themes
What are the barriers of a curricular reform as perceived by secondary school leaders?	Physical Barriers	Pandemic Time Planning Technology Policies and Proximity
	Social Barriers	Instructional Practice Communication and Collaboration Sustaining Change Personal and Emotional Factors
	Leadership Barriers	Defined Roles Administration and Content Administration and District Support

**Pandemic.** Given the COVID-19 pandemic, teachers, deans, and assistant principals all referred to the health crisis as an added barrier to the implementation of the new curriculum. *Cassandra* noted the additional challenges, stating, “The levels that we’re in are constantly changing which means our instruction is constantly changing.” She referred to the levels associated with distance learning and how these changes impact instruction. Curricular reform alters instruction in and of itself, but the pandemic compounded the complexity of designing instruction.

**Time.** Time was the most cited physical barrier in the study and was mentioned by members from all leadership roles. Participants referred to the barrier of time in terms of covering content in the classroom, collaborating with peers, and learning the new curriculum. *Andrew* expanded upon this barrier, suggesting time also impacted one’s ability to be innovative. He shared, “I think [time] limits our ability or willingness to think outside the box or try something, because we’re so pressed for time, or at least we feel like we’re so pressed for time.” He alluded to the idea that education professionals often perceive they are pressed for time, which may result in resistance to change and further hinder curricular reform processes.

**Planning.** Several teacher leader participants commented on the physical barrier of planning instruction with a new curriculum. *Cassandra* stated, “The other barrier is it’s a ton of work the first year... You have to stay a couple steps ahead of your students and know where it’s going.” *Andrew* echoed *Cassandra*, affirming, “You don’t know necessarily what’s coming up, where this is going, and have the time to really dig into that, at least in the first year or two.” The lack of experience with the curriculum resulted in a barrier for teachers as they prepared instruction for their students using the new curriculum materials.

Participants from each focus group elaborated on how scheduling structures in their buildings allowed them to address planning barriers throughout the implementation of the curricular reform. *Cassandra*, *Tamaya*, and *John* shared how their buildings created schedules that provided for team planning, which in turn fostered collaboration through the implementation of the new math curriculum. *John*, a principal, detailed his experience and the importance of such scheduling structures, stating, “If we’re going to develop and implement new curriculum and then we want teachers to collaborate, we want to build trust...if we give them [planning] time, you’ll see all those things foster.”

**Technology.** While technology proved to be a common barrier among participants’ experiences, it was not access to technology that they described, rather, participants expressed barriers in how the technology could be used to support instruction. For example, teachers noted that touch-screen laptops would be beneficial and limitations with regards to the functionalities of online homework. *Tamaya*, an assistant principal, also expressed how the incorporation of technology presented a barrier between the teacher and students when protocols were not in place. Participants articulated the importance of not only considering access to technology, but also how technology was to be used when implementing the new math curriculum.

**Policies and Proximity.** Policies and proximity were not referenced frequently, but a few teacher leaders commented on the barriers these elements presented when implementing the new curriculum. *Colin* shared how he felt policies, such as grading requirements, limited his ability to propel the reform process forward, stating, “I feel like the policies have kind of forced us into those older ways...I can’t do all the cool things I want to do because I’m so tied into [policies].” In addition, *Andrew* and *Cassandra* described proximity as a barrier to collaboration given teachers at their respective schools were physically distanced from colleagues in the math department that taught the same courses. They described how proximity limited the extent to which resources and informal dialogue were shared among colleagues regarding their daily experiences in implementing the curriculum.

**Social Barriers.** Social barriers are defined as personnel, emotional, and relationship elements that may obstruct the educational environment. Participants from all leadership roles noted social barriers they perceived influenced the curricular reform in their school settings. Four sub-themes of social barriers emerged: instructional practice, communication and collaboration, sustaining change, and personal and emotional factors.

**Instructional Practice.** Curricular reforms are often accompanied by new instructional methodologies. Several participants indicated this presented a barrier when engaging teachers in the reform process. *Tamaya* shared, “Sometimes I think we do what’s convenient for adults in schools, not what’s best for kids. It’s convenient to stay the same way, it’s convenient to not have to change because it’s hard, but that doesn’t get you results.” Participants stressed the importance of changing more than just the physical

curriculum materials through the implementation process, but also reforming instructional practices to better meet the needs of students.

*Andrew* and *Natalie* shared how they personally tried to address the social barrier of their colleagues' mindsets and instructional practices by sharing ideas and resources. *Natalie*, a dean, explained that the reform process and the implementation of new instructional practices also required students to alter their mindsets and approach to learning. She stated, "Trying to get [students] to buy into math, that's a little frustrating for some teachers as well because...they have that mental barrier inside of them right now."

During the focus groups, *Dan* and *John*, both administrators, voiced how scheduling and collaborative structures addressed social challenges associated with instructional practices. *John* explained, "The more teachers collaborate, especially on new curriculum that's brought in, the better the teaching techniques, the better the units and the lessons that are, that are developed and prepared, and the better outcomes for the kids." Curricular reforms are contextualized by change, including changes in instructional practices. Leaders in this study suggested these changes posed as barriers for teachers and students as they were presented with new approaches and instruction in mathematics, but they also employed methods to address such barriers throughout the reform.

**Communication and Collaboration.** Participants from all leadership roles commented on factors related to communication and collaboration that proved to be social barriers through the curricular reform process. *Chris* emphasized the importance of relationships with his colleagues when engaging in the curricular reform process as he detailed instances in which teachers may have refrained from asking questions in fear of being judged. *Tom*, a principal, communicated that he tried to address this barrier during the hiring process as it impacted collaboration efforts beyond the curricular reform. *John*, also a principal, shared that collaboration can play a role in overcoming other barriers, explaining, "I think the teachers that are struggling are going to get better because they're working with other groups or other teachers in their departments."

Participants elaborated on the communication and collaboration barrier during the focus groups, indicating that while these practices were strong within grade levels and common

courses, they were limited across courses, the district, and leadership levels. The teacher leaders voiced the strength of the culture and collaboration with colleagues teaching the same courses. However, *Cassandra* and *Colin* expanded upon this, citing that the physical barrier of proximity impacted collaboration and communication across courses within their school buildings. In parallel, while individuals from all leadership roles highlighted the culture and collaboration within their buildings, the teacher focus group and the dean and assistant principal focus group conversed about such practices being limited across the district. Furthermore, participants voiced the need to expand communication and collaboration across leadership levels to support the curricular reform process. *Colin*, a teacher leader, stated, "[Administrators] don't know what we need, and we haven't necessarily told them what we need." This connected to *Dan's* insights from an assistant principal perspective as he explained, "If you're an administrator, you're seen as being on the other team, oftentimes, and not nearly as approachable as you believe yourself to be, and that's unfortunate." These comments highlighted the disconnect in communication and collaboration between teachers and administrators and administrators extended this disconnect to communication challenges between administrators and district leaders. Given the participants' experiences, communication and collaboration proved to be a barrier contributing to the implementation of the curricular reform.

**Sustaining Change.** A teacher and an assistant principal referred to sustaining change as a social barrier. *Dan* described, "Sustaining those has got to be a very, very high priority... Reminding each other that we're not just going to try this thing until it gets replaced with that thing... because then your investment level is very low." He suggested if the investment level is low, teachers will not engage in the curricular reform or revert to previous curricular practices.

The dean and assistant principal focus group and the principal focus group expanded upon the processes necessary to sustain change initiatives. *Micah*, *Tamaya*, and *Tom* referred to hiring processes and retaining staff to maintain the momentum of change efforts, including the implementation of the mathematics reform. *Tom* shared, "We invest a lot of time, money into staff, and then if we can't keep them in our district from one building to another or even at your own building, it hurts to keep the initiative moving forward." The administrative leaders perceived processes to



retain staff were critical in sustaining change efforts.

**Personal and Emotional Factors.** The final sub-theme, personal and emotional factors, was only noted by those in administrative roles. Kelly, a principal, shared personal and emotional factors she observed in her teaching staff as they implemented the curricular reform, explaining, “I think it’s confidence...I would say it’s a first year thing. We’re all going to be unsure and not have the confidence, but I think as we move into the next year we just build on that confidence.” She also expressed how she addressed these barriers, stating, “Anytime we’re rolling out something new you’re going to go through those periods of frustration, and...that’s where we need to provide [teachers] that self-care.”

**Leadership Barriers.** As participants described their experiences within the curricular reform process, leadership barriers emerged as a common theme, but the sub-themes were unique to their leadership roles. The sub-themes referenced by participants included defined roles, administration and content, and administration and district support.

**Defined Roles.** This sub-theme was articulated by *Cassandra*, a teacher leader. She shared her experience, describing the barriers she faced in guiding the implementation of the curricular reform at her school. *Cassandra* explained, “I don’t think that we have a clear purpose of the leadership team, and then also, who they are and kind of how to roll out this curriculum. So, I think not having clear guidance on what our role is.” *Cassandra’s* frustration was communicated as she was unclear of her leadership role throughout the implementation of the curricular reform.

**Administration and Content.** Teacher leaders and deans in the study both expressed administration’s math content knowledge as a potential barrier to leading the curricular reform process. *Colin* shared, “I think a lot of it is just

[administrators] don’t know. I would like them to come in and see what it’s like.” *Victor* echoed *Colin*, stating, “All of our administration comes from teaching disciplines other than math.” *Micah* and *Natalie*, both deans, communicated that they needed to understand the materials and content better to be able to support teachers. While participants communicated that being a content expert was not necessary for those in administrative positions, they also stressed the importance of administrators developing familiarity with the content and curriculum being implemented through the reform process.

**Administration and District Support.** Principal leaders conveyed district support as a barrier to their leadership roles within reform processes. District support referred to individuals such as the superintendent, assistant superintendent, and curriculum director. *Tom* shared, “I’m only middle management. So, [teachers] will try to go over your head at times, and if they can find support there then it kind of derails what we’re trying to do here.” Principals indicated they needed support throughout the curricular reform process and that this support comes from the district level. The principals suggested lack of district support could potentially hinder the leadership role of principals in supporting the implementation of the curriculum within their school settings.

**EFFICACY**

During the interview and focus group processes, participants were asked to describe their efficacy beliefs in relation to leading the implementation of the curricular reform and whether the content area, in this case mathematics, further influenced these beliefs. Relationships emerged as a common theme that influenced participants’ efficacy in leading the implementation of the reform, while experience surfaced as a theme with regards to the impact of mathematics on one’s efficacy beliefs. Furthermore, several sub-themes of relationships and experience emerged

Table 4: Leaders’ Efficacy Beliefs: Themes and Sub-Themes

Research Question	Themes	Sub-Themes
How do secondary school leaders’ perceived efficacy beliefs influence the nature and extent of their role during a curricular reform?	Relationships	Voice and Credibility Belief and Support
	Experience	New Curriculum Grade/Course Administration

and aligned to the leadership roles of the participants. Table 4 presents the themes and sub-themes related to leaders' efficacy beliefs.

**Relationships.** Throughout the individual interviews, relationships emerged as a theme that influenced one's efficacy beliefs regarding their leadership role during the curricular reform. The sub-theme that emerged from teacher leaders was voice and credibility, while the sub-theme that arose for those in administrative positions was belief and support.

**Voice and Credibility.** Teacher leaders spoke about their voice and credibility throughout the implementation of the curricular reform. Teachers commented on their positionality and serving on the district-committee, describing how this offered them credibility in their relationships with colleagues. *Andrew* explained, "Being involved in the processes and being willing to be involved in the process, knowing others aren't, I think gives me the position to speak up." In addition, *Chris* described how his relationships with colleagues influenced his self-concept and willingness to voice his thoughts throughout the implementation process.

Two teacher leaders also reflected on their credibility given their relationships with colleagues and discussed how this challenged their efficacy beliefs. *Cassandra* commented, "Where I don't feel confident is inspiring that same ambition or excitement for a curriculum. I guess, if I'm excited about it, I hope my excitement can inspire others." Teacher leaders in the study expressed their need to develop relationships in which they feel they have a voice and credibility amongst their colleagues. These factors influenced their self-efficacy beliefs that either bolstered or hindered their role as teacher leaders throughout the implementation of the curricular reform.

**Belief and Support.** Conversely, the deans, assistant principals, and principals in the study spoke about their efficacy in terms of their belief in the curriculum and support for teachers. The administrative leaders communicated that when they developed an understanding of the new curriculum and believed in the curricular reform being implemented, this in turn cultivated their own efficacy beliefs that influenced their relationships with teachers when leading the implementation of the math reform. In addition, administrators indicated their strengths and efficacy beliefs came from offering support to teachers during the implementation.

**Experience.** Most of the teacher leaders expressed strong efficacy beliefs regarding the mathematics content, while administrators made comments about their lack of mathematics content knowledge. For example, *Natalie* stated, "You know, math is not my strongest adventure in life," and *Dan* acknowledged, "The curriculum side of things is a little outside my comfort level." However, these comments by both teachers and administrators were brief. As the participants reflected on whether mathematics influenced their efficacy beliefs, conversations were centered around the theme of experience with comments organized into three sub-themes: new curriculum, grade/course, and administration.

**New Curriculum.** Teachers, deans, and assistant principals all expressed limited efficacy during the mathematics curricular reform given their lack of experience with the new curriculum. Teacher leaders expressed challenges regarding their ability to anticipate the direction of the curriculum. *Colin* elaborated on his experience, explaining, "I have to learn it first and that's one thing that is definitely different from last year. Last year...I could know where the conversation was going to go and know where those big mistakes were going to happen." One of the deans and one of the assistant principals expressed similar sentiments, describing their lack of knowledge in the new curriculum.

**Grade/Course.** Another sub-theme related to mathematics efficacy that emerged from the teacher leaders was their experience pertaining to a specific grade or course level. Teacher leaders expressed their limited efficacy outside of their grade or course and furthermore, that their colleagues in those areas are often resistant. *Colin* commented, "I get a lot of, and understandably, a lot of, 'You don't know what we're doing. You don't have any clue what it's like to teach algebra. I'm like, you're right, I don't. But, I do know what's best practice.'" Despite comments from colleagues, he maintained strong efficacy beliefs that extended beyond experience with specific mathematics content to pedagogy and instructional practices.

**Administration.** The final sub-theme arose from the administrative leaders and reflected the role of their administration experience on their efficacy beliefs as it related to mathematics. Administrative participants reported they did not feel as though they needed extensive efficacy or experience in mathematics content. These sentiments were echoed again within the administrative focus groups. *Dan* and *Kelly* described their roles as instructional

leaders, focusing on facilitating processes and offering support throughout the curricular reform. *Tamaya* shared, “‘The facilitator is the flow person, not the know person,’ and I really love that because I don’t feel like I have to be the know person as long as I can facilitate what’s going to occur around me.” Administrative leaders did not believe they needed to be content experts and felt they should focus on developing their efficacy beliefs to further establish relationships with teachers that would drive the curricular reform process.

As the teacher leader focus group reviewed the administrators’ perspective, the teachers explained their administrators trusted them to be the experts and deliver the mathematics content. As *Andrew* explained, “I’m not expecting [administrators] to be content masters or even really understand what we’re doing.” *Chris* and *Victor* both agreed with *Andrew’s* comments, describing how administrators offered valuable feedback regarding universal teaching practices. The teacher leaders expressed appreciation for the trust they were afforded from principals, as *Andrew* stated, “I also appreciate that we’re treated as professionals and that we’re going to get our stuff done, and we can handle what’s thrown at us.” The leaders in this study, whether teachers or administrators, articulated similar perceptions in that administrators did not need to possess strong efficacy in mathematical content to facilitate the implementation of the curricular reform in mathematics.

### RECOMMENDATIONS FOR FUTURE MATHEMATICS REFORMS

Each focus group was prompted to consider recommendations for future curricular reforms and this dialogue extended beyond the research questions outlined in this study. Much of the dialogue regarding participants’ recommendations for future reform efforts addressed considerations of the processes utilized prior to the implementation phase. The teacher leader focus group stressed the need to broaden the pilot and selection process further in terms of time and teachers involved. *Cassandra* explained, “Yes, having one geometry from each school is helpful, but that’s not who they’re used to collaborating with and so we need more of each team to be a part of that process.” Collaboration was a key transformational leadership practice for the teacher leaders in the study, but *Cassandra’s* experience indicated collaboration was limited within the scope of the pilot process. In addition, *Andrew* described the need to lengthen the timeframe of the pilot, highlighting the importance of exploring and understanding the

technology components prior to adoption and implementation of the new curriculum.

Similarly, participants from the dean and assistant principal focus group offered recommendations for the selection phase prior to implementation, but they focused on the need to consider the range of learners within the mathematics selection process. *Tamaya* stated, “I really feel like a challenge has been...that when we do curriculum adoptions we only address one area. We don’t look at the whole big picture of all students, where we’re looking at all the tiers.” *Micah* echoed her comments, describing the need to consider students that struggle with mathematics and how the curriculum will meet those students’ needs.

## Discussion

Leading school change, specifically curricular reforms, is a lengthy and complex process. Furthermore, mathematics reforms are cyclical as research and changing demands frequently inspire revisions in pedagogy and instructional design. As a result, school leaders are tasked with continually guiding curricular reform processes in their schools. The transformational leadership approach outlines how school leaders may engage teachers in curricular reform efforts, motivating and nurturing them through the implementation process (Northouse, 2016). Central to the transformational leadership approach is both leaders’ and followers’ self-concepts (Bass, 2000; Northouse, 2016), which are influenced by one’s efficacy beliefs (Bandura, 1989, 1993). However, there is a lack of research exploring the interrelationship between efficacy beliefs and transformational leadership practices. This study’s findings suggested there is a relationship between leaders’ efficacy beliefs and transformational leadership practices when facilitating a curricular reform.

Overall, leaders in the study shared several behaviors and practices they engaged in throughout the implementation of the curricular reform that aligned to the transformational leadership approach. Bass identified four factors which influence a leader’s ability to transform the thinking and actions of followers: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass, 1985, 2000). In addition, Kouzes and Posner (2017) detailed the need for transformational leaders to be honest, competent, inspiring, and forward-thinking to drive change processes. This study adds to the research as these practices were cited by participants engaged specifically

within the context of a mathematics reform phenomenon. Participants from all leadership roles described practices throughout the implementation of the mathematics curricular reform related to culture and collaboration, shared leadership, motivation and innovation, and supportive considerations. Thus, the findings revealed leaders utilize and practice key elements of the transformational leadership approach when engaged in a curricular reform.

The leaders were also asked to expand upon the barriers they perceived influenced the implementation of the secondary mathematics reform. Participants described physical, social, and leadership barriers that emerged at their schools. As focus groups reviewed these barriers, the dialogue shifted to reflect associated transformational leadership behaviors that addressed some of the barriers within the scope of the curriculum implementation and those that could potentially overcome additional and future barriers. For example, administrators stressed the importance of scheduling frequent collaborative opportunities to address resistance associated with implementing new instructional approaches and practices. In addition, multiple focus groups described barriers associated with communication, citing communication was strong within their immediate group of colleagues but limited beyond their given group. It is recommended purposeful opportunities for communication across courses and across schools within the district be scheduled throughout the curricular reform process. Lastly, the administrative focus groups emphasized the importance of retaining staff to sustain change efforts associated with the curricular reform. Administrators enacting transformational leadership practices are attentive and responsive to the needs of their staff to support a positive school culture that is likely to retain staff. The connection between barriers and transformational leadership practices emphasizes the value and power of transformational leadership in propelling curricular reform efforts forward.

Finally, an individual's self-efficacy beliefs affect one's control over their thoughts and abilities (Bandura, 1989, 1993). The study indicated such efficacy beliefs influenced participants' transformational leadership behaviors and practices. Leaders reflected on their efficacy beliefs related to facilitating the curricular reform process and to mathematics content. Participants from all leadership roles expressed how their efficacy beliefs in guiding the implementation of the mathematics curriculum were dependent upon their relationships with teachers engaged

in the reform process. Given transformational leadership is defined by the relationship between leaders and followers (Northouse, 2016), it is vital leaders from all roles possess strong self-efficacy beliefs when considering their relationships with teachers if they are to be tasked with leading a curricular reform. In reference to mathematics self-efficacy, participants expressed the influence of experience on their beliefs rather than the mathematics content knowledge itself. Teacher participants articulated their beliefs were dependent upon their instructional experience and administrative participants' beliefs were dependent upon their leadership experience. Most teacher leaders expressed they felt confident in their mathematical content knowledge, but within the scope of the reform process they were less efficacious in delivering math content given they were unfamiliar with the new curriculum. Administrators indicated they did not feel the need to possess strong efficacy beliefs related to mathematics content. Given their positional roles, administrators expressed it was more critical to develop strong efficacy beliefs related to facilitating the reform process and providing support to teachers. Teacher leaders, on the other hand, described how administrators' lack of content knowledge proved to be a challenge at times throughout the implementation of the curricular reform and beyond. However, they did value the administration's trust in their ability to deliver effective mathematics instruction. These findings suggest that while administrators do not require an extensive background in mathematics, expanding their knowledge related to mathematics content and pedagogy may enhance their efficacy as it relates to relationships with teachers and their transformational leadership practices in leading curricular reform processes.

### *Implications and Conclusion*

Research studies, including this phenomenological study, suggest mathematics leaders utilize transformational leadership approaches as they guide change initiatives. The findings of this study expand upon such literature, positioning transformational leadership practices specifically within the context of curricular reforms and in relation to efficacy beliefs. Based on this study's findings, it is recommended that schools preparing for the implementation of a mathematics reform consider the efficacy beliefs of leaders from all leadership roles in relation to their relationships with teachers that will be implementing the new curriculum. Individuals with strong efficacy regarding their relationships with these teachers should be

positioned in leadership roles to drive reform efforts. It is also recommended that leaders are afforded the chance to increase their experience with the mathematics curriculum prior to implementation and to expand communication and collaboration throughout the implementation process. In particular, communication and collaboration should be

extended beyond common grade levels and courses to include such practices across courses, the district, and leadership levels. If these opportunities are presented, leaders may increase their self-efficacy by deepening their relationships and therefore strengthening their roles as transformational leaders through mathematics reform processes. 🌟

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## Appendix A

### Individual Interview Protocol

The following questions guided the interview, beginning with the warm-up questions to gather background information and to help the participant feel at ease. These questions were followed by the interview questions (IQ) that are organized around the study's research questions (RQ).

#### Warm-Up Questions:

1. What is your educational background?
2. Tell me about your professional experience and roles in the education field.
3. What is your current role in education and how long have you occupied this role?
4. Who is a teacher leader that emerged through the mathematics reform?

#### **RQ 1: How do secondary school leaders exhibit transformational leadership practices during a curricular reform?**

- IQ 1: Describe your leadership experience and role within the scope of the mathematics curriculum adoption and implementation.
- IQ 2: Describe the relationship between you and the teachers engaging in the mathematics curricular reform.
- IQ3: Describe the relationship between you and other school leaders (including teacher leaders) in the mathematics curricular reform.
- IQ 4: Describe what you perceive as effective leadership behaviors and practices that supported teachers through curriculum reform process.
- IQ 5: How do you, within your leadership role, act as a role model to the mathematics teachers implementing the curricular reform?
- IQ 6: How do you, within your leadership role, inspire and motivate mathematics teachers engaging in the curricular reform process?
- IQ 7: How do you, within your leadership role, encourage innovation and the exploration of new teaching pedagogies within the scope of the mathematics reform?
- IQ 8: How do you, within your leadership role, support individual teachers' needs as they implement the new mathematics curriculum?

#### **RQ 2: What are the barriers of a curricular reform as perceived by secondary school leaders?**

- IQ 9: What do you perceive are the physical barriers (i.e. time, budget, etc.) hindering the implementation of the new mathematics curriculum?
- IQ 10: What do you perceive are the social barriers (i.e. culture, relationships, etc.) hindering the implementation of the new mathematics curriculum?
- IQ 11: What do you perceive are the barriers that impact leaders' roles in supporting the implementation of the new mathematics curriculum?
- IQ 12: How do you, within your leadership role, address these perceived barriers and resistance to the mathematics curricular reform?

**RQ 3: How do secondary school leaders' perceived efficacy beliefs influence the nature and extent of their role during a curricular reform?**

IQ 13: Describe your level of comfort and confidence in leading the implementation of curricular reforms.

IQ 14: To what extent does your comfort and confidence levels change depending on the content area of the curricular reform? In this case, with regards to mathematics?

Appendix B  
**Focus Group Protocol**

The following questions guided the focus group dialogue as participants review the unified description compiled from the individual interviews.

**Focus Group Questions:**

1. Upon reviewing the textural description associated with your leadership role, what needs to be added or expanded to clarify your experience of the mathematics curricular reform?
2. Upon reviewing the structural description associated with your leadership role, what needs to be added or expanded to clarify your experience of the mathematics curricular reform?
3. How closely do you feel the description represents your leadership experience within the scope of the mathematics curricular reform?
4. What similarities and differences do you notice between the descriptions for your leadership role and the other leadership roles?
5. Based on the unified description, what recommendations would you offer for future curricular reforms, whether in mathematics or other content areas?