

The Impact of Model Lessons on Teachers' Perceptions of High-Quality Instructional Materials

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Foreword

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About the Author



Andrew Paulsen is currently a Senior Advisor with Agile Mind, an organization that looks to transform the teaching and learning of mathematics and science throughout the United States. Paulsen was formerly an award-winning High School Math Teacher and Instruction Coach in the Newark Public Schools and spent time abroad as a Fulbright Scholar in Kaohsiung, Taiwan researching eastern pedagogy and policy. Originally from Levittown, New York, Andrew received his B.A. from Marist College, his Master's in educational policy from Seton Hall University, and an Ed.M. in public school leadership from Columbia University.

Executive Summary

A landmark study found that students spend over 500 hours per year on school assignments that are below grade level, negatively affecting their achievement (TNTP, 2018). To correct this situation, many schools have introduced high-quality instructional materials that are rigorous and developmentally appropriate. Unfortunately, the failure to implement these resources as intended often undercuts any impact that they might have (Donohoo & Katz, 2020). While some teachers state a desire to change their pedagogical practices, they fail to do so for a number of reasons (Le Fevre, 2014). In the current study, I examine the efficacy of model lessons by testing this hypothesis: if teachers witness a content specialist model a lesson with new instructional materials using students in their school, they will be more likely to implement the instructional materials in their own classrooms. The findings of this study will help inform the delivery service models of Instruction Partners and add to their *theory of change* moving forward.

*“If we teach today’s students as we taught yesterday’s, we rob them of tomorrow.”
-John Dewey, Experience and Education, 1938*

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Definition & Acronyms

Content Specialist	An instruction leader who has significant expertise with content pedagogical knowledge. Similar terms include instructional coach, instructional specialist, educational specialist, TOSA (teacher on special assignment), or content lead.
HQIM	(High Quality Instruction Materials) A comprehensive curriculum that provides educators with daily easy-to-use resources to support the teaching of rigorous, grade-aligned standards. The research literature also leverages the term “high-quality curriculum” to refer to HQIM.
IP	(Instruction Partners) A nonprofit organization that is dedicated to support the implementation of HQIM in partner school districts. IP is also the main partner organization for the current study.
Model Lesson	A sample lesson led by a content specialist in the classroom of a teacher’s current class of students. Key to the idea behind this study is that the model lesson needs to occur in the school where the teacher, who is being supported by the content specialist, is employed.
Modeling	For the purposes of this study, the process of leading a model lesson.

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*Dedicated to the students of the Newark Public Schools,
and the future leaders of our global community.*

*Let us not rest until everyone has the opportunity
to attain a truly excellent education.*

Introduction

Early in my teaching career, in my attempts to develop lessons that were engaging, rigorous, and culturally relevant, I often searched the internet for resources created by fellow educators. Apparently, I was not alone. One survey conducted by researchers at the Rand Corporation using a nationally representative sample of educators found that 96% of public-school teachers employ Google in their daily search for resources, while 75% use the social media platform Pinterest when developing their lesson plans (Opfer, Kaufman, & Thompson, 2016). Other research has shown that the average teacher spends between seven and twelve hours per week searching online for instructional materials (Goldberg, 2016) and over 80% of secondary English and 72% of secondary Math Teachers do not use any form of HQIM in their classroom (Kane et al., 2016).

As a new teacher, I also visited the classrooms of experienced colleagues. These visits were eye-opening and I quickly realized that every teacher's method of instruction and class culture were very different. Some colleagues held high expectations for their students, as evidenced by the presence of rigorous lesson materials and high behavioral expectations, whereas other teachers, using lesson materials that were significantly below grade level, appeared to be struggling to engage the students in their classroom. I wondered how teachers, working in the same building with students from the same neighborhood and socio-economic background, could present such different lessons?

During my third year of teaching, a new high-quality math curriculum was introduced at my school; this innovation dramatically changed my workflow by providing grade-appropriate curricular resources that were aligned with the emerging cognitive science about how students best learn mathematics. Adoption and purchase of high-quality instructional materials can support teachers by reducing time spent searching for lessons online while affording students the opportunity to engage in grade-level content. Polikoff (2021), Pondisicio (2019), and other leaders in the modern curricular reform movement suggest that high-quality instructional materials help teachers raise the expectations they have for their students and thus help close persistent opportunity gaps in learning by providing teachers with daily lesson resources.

Unfortunately, efforts to implement these high-quality instructional materials (HQIM) often fall short of their mark. Many educators lack the skill set or professional outlook needed to execute the lesson materials as intended (Donohoo, 2020). Drago-Severson (2009) points out that knowledge alone rarely changes teacher practice, and any program set up to achieve the goal of improving teaching and learning must be well implemented (Rossi, Lipsey, & Henry, 2019).

To help teachers implement new curricular resources, school districts often partner with professional development providers. One of these groups, Instruction Partners (IP), supports 230 school and district leadership teams across the United States by helping teachers deliver better instruction through the implementation of high-quality instructional materials. IP is eager to identify the types of support that lead to the successful implementation of HQIM and improved teaching practices, with the ultimate goal of increasing student learning (Lowe, 2019).

Nationally, teachers are involved in professional learning opportunities for as many as 19 days per year, causing many critics to question whether the time and money spent on these programs actually improves the quality of teaching (TNTP, 2015). IP wants to ensure that its support is transformative and worth the money.

This project aims to more fully understand how a promising professional development opportunity, model lessons, can help IP better support teachers in implementing high-quality instructional materials in their classrooms. A model lesson is one taught by a content specialist to a class of a students in the school where that teacher currently works. Model lessons are a promising strategy for supporting the implementation of HQIM as they have the potential to challenge teachers' perceptions about the curriculum itself while highlighting how to use the HQIM as intended. At the same time, model lessons showcase the fact that their students are capable of learning rigorous grade-appropriate standards.

Even though they constitute a promising strategy for professional development, model lessons appear to be used infrequently because of the time required, as well as discomfort on the part of the content specialist when teaching another teacher's class, or uneasiness on the part of a teacher in having their students taught by someone else. The current study examines the impact of model lessons on teachers' perceptions about and use of HQIM. The results of the study will serve to enhance Instruction Partner's *theory of change* and improve the effectiveness of its service delivery models moving forward.

Organizational Context

This research project was conducted in partnership with Instruction Partners (IP), a nonprofit organization that works “to ensure equitable access to great instruction for students in poverty, students of color, students learning English, and students with disabilities” (Instruction Partners, 2020, para. 3). Instruction Partners was co-founded by Emily Freitag and Luke Kohlmoos in Nashville, Tennessee in 2015. Originally, the organization focused its improvement efforts on smaller school districts and charter management organizations. Recently, however, it has broadened its scope to include larger school systems.

IP helps school districts transform student learning outcomes by focusing on what former Harvard Graduate School of Education Professor Richard Elmore calls the “instructional core,” i.e., the interplay between student, teacher and content (City, Elmore, Fiarman, Teitel, & Lachman, 2018). IP concentrates on what educators are teaching, examines whether or not it results in student learning, and often supports the implementation of high-quality instructional materials (HQIM) in their partner schools.

For the purposes of this study, HQIM are defined as a comprehensive set of educational curriculum materials with “specific learning goals and lessons aligned to content standards, student-centered approaches to inquiry-based learning, research-based teaching strategies, teacher support materials, and embedded formative assessments to effectively help teachers implement instructional units and courses that are integrated, coherent, and sequenced” (Short & Hirsch, 2020, p. 6). EdReports, a nonprofit organization founded in 2015, is one of the leading

national authorities that determines whether HQIM are considered high-quality (Gewertz, 2020). Many states and districts look to EdReports when adopting new materials.

IP has developed a *theory of change* (see figure below) built upon the principle that student learning improves when 1) school districts enhance the rigor of their curriculum, 2) school leaders increase the skill and knowledge that teachers bring to their instruction, and 3) teachers increase the level of active learning taking place in their classrooms. Put simply, IP's *theory of change* provides districts with the knowledge, skills, and tools necessary to ensure that their schools offer effective teaching, rigorous content, and engaging lessons. Using this *theory of change*, Instruction Partners seeks to offer affordable, scalable, and effective service delivery models that will improve student learning outcomes in their partner districts. To achieve this end, IP has recruited a team of elite teachers and leaders who are qualified content specialists; this group will be responsible for leading model lessons in the present study.

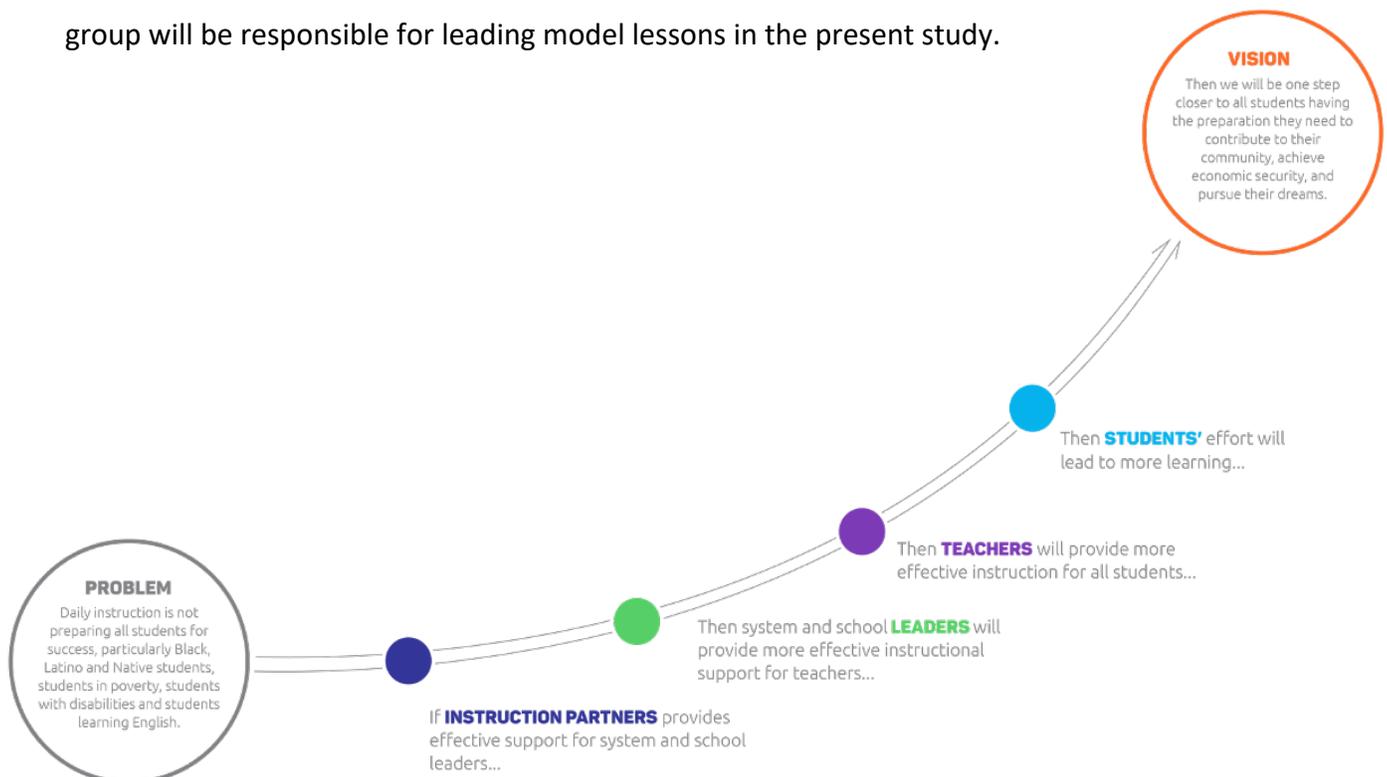


Figure 1: Instruction Partners theory of change

Though its *theory of change* is research based, Instruction Partners is eager to continue to examine the efficacy of its professional services moving forward. Currently, the organization provides several professional development opportunities, including curriculum internalization meetings, targeted teacher coaching, leadership walk-throughs, and a number of other improvement interventions. Implementing high-quality curricular resources and raising teacher expectations are two key elements in Instruction Partners' school improvement paradigm. Though the results of a number of studies point to the importance of teachers having high expectations for their students (e.g., Jussim & Harber, 2005; Rosenthal & Jacobson, 1968), far less has been written about how organizations can support schools in their efforts to raise their faculty's collective expectations through the implementation of high-quality curricular resources.

Problem of Practice

Teachers inadvertently perpetuate the cycle of low expectations when they assign students work that is below grade-level (TNTP, 2018). Like so many of us, resistance to change can cause teachers to stick with older, less-rigorous materials or to develop their own unvetted resources with support from the internet.

Some teachers may also fail to implement the materials as intended. Consequently, they diminish the rigor of their lessons and occasionally reject high-quality instructional materials in favor of their customary, low-rigor lessons that provide few opportunities for active learning (Wilhelm, 2014; Jackson et. al., 2013). When teachers develop their own lessons, the

instructional materials they choose are often developmentally inappropriate for their students, leading to lower student engagement and learning (TNTP, 2018; Goldberg, 2016). For example, community colleges across the country report that about 40% of students (including two-thirds of black and half of Latino students) need to enroll in at least one remedial course, addressing concepts that should have been mastered during their high school years. These remedial courses cost U.S. taxpayers over \$1.5 billion dollars annually (TNTP, 2018).

The lack of well-implemented HQIM has a disproportionate impact on low-income students and those of color, who in general are far less likely than their middle and upper-class counterparts to be given rigorous, high-quality content, both during school hours and while at home (Schmidt, Burroughs, Zoido, & Houang, 2015). For example, the authors of *The Opportunity Myth* reported that of the 720 hours that public school students spend on assignments each school year, the average student spends about 80% of their time on tasks that are low-quality and below grade level. About one-third of students of color never receive one assignment that is considered to be on grade level (TNTP, 2018).

Challenge Facing Teachers and Leaders

Researchers have long noted that the absence of a universal high-quality curriculum in the United States has been a major shortcoming in our system of education (Ball & Forzani, 2011). In 2008, 45 state governors signed onto the Common Core State Standards (CCSS) initiative. While the universal standards held initial promise, they were ultimately rejected in favor of more

local, state-specific learning standards (Polikoff, 2021). In addition, the CCSS did not provide teachers with resources to support them in their daily planning, and only called for specific learning standards which were implemented inconsistently throughout the country (Polikoff, 2021).

State-specific standards and local curriculum adoptions often mean it is up to school and district leaders to identify and purchase instructional materials. School leaders often lack the expertise needed to lead complex implementation initiatives and are unaware of best practices that are based on current research about adult learning and professional development. Disconnected principal preparation may be partly responsible for this lack of knowledge (Hess & Kelly, 2005). In addition, some district leaders fail to fully understand the potential value that a set of HQIM might bring to their districts (Roberts & Hernandez, 2012). For all these reasons, the implementation of new district policies, programs, and curriculums is often incomplete, leading to mediocre student achievement (Goldstein, 2019).

To ensure that all students have access to exceptional curricular materials, equitable instruction, and high teacher expectations, IP recommends that schools adopt, purchase, and implement high-quality instructional materials aimed at raising the expectations that teachers have for their students. Considerable evidence exists about the benefits accrued from the use of high-quality instructional materials (Short & Hirsch, 2020); unfortunately, many district and school leaders have difficulty in implementing these evidence-based practices at scale (Burner, 2018).

Implementation Challenges

Teachers resist curriculum changes for a number of reasons. One, some school districts change resources so frequently that veteran teachers have learned that they need only “weather the storm” until another is adopted (Tapper, 2018; DeWitt, 2014). Two, some teachers do not fully understand the design intentionality of the new curriculum and, therefore, question its value in their classroom. Three, others falsely believe that the new curriculum is too rigorous for their students, and do not think that their students are prepared or “ready” for the new HQIM. Four, many teachers are used to some level of professional autonomy, which they perceive is challenged by HQIM. And five, since a number of teachers have historically created their own lesson materials, they often favor their approach over a new comprehensive curriculum, regardless of the effectiveness of their current lessons.

This situation is further complicated by the fact that less than a third of teachers report that they are given timely and useful feedback, despite most saying that they want actionable feedback (Bailey, 2017). In some schools, a misalignment exists between the expectations that leaders have of their teachers and their formal evaluations of them. As a consequence, teachers overestimate their effectiveness, leading many to question why there is any impetus for change (Martone & Sireci, 2009). Adopting any new high-quality instructional material as intended is a significant challenge for school and district leaders. Unfortunately, the outcome of taking this step is often compliance rather than transformation, as teachers try to use the new set of HQIM as supplemental resources as opposed to their main curricular resource (Remillard, 2018).

Instruction Partners' Levers

The leadership at Instruction Partners reports that in the classrooms for which they have responsibility, their content specialists frequently observe the same problem repeating itself. For example, during one focus group, IP content specialists reported that teachers failed to use the high-quality materials provided as intended for many of the reasons described above. Therefore, in a number of schools where teachers have access to HQIM, they modify these materials for a variety of reasons (see literature review to follow), thus reducing the high-quality nature of the resources. Although these schools have purchased HQIM, they fail to have the expected transformative impact because of poor implementation.

Instruction Partners is exploring ways in which they can increase the likelihood that teachers will leverage the full potential of new HQIM. After all, the organization's success is based on its ability to get teachers to implement HQIM and realize gains in student achievement. As IP has searched for ways to be more effective, at least one content specialist has suggested that it is difficult for some teachers to understand the design intentionality of a lesson without first seeing it in action. As such, witnessing a model lesson from a content specialist might just be the innovation that is needed to support those that are involved in implementing new HQIM.

Summary

Research findings suggest that model lessons might be a worthwhile intervention capable of supporting teachers as they implement high-quality and grade-appropriate curricular

resources in their classrooms. First off, content specialists could lead by example. Not only do they deliver new instructional strategies; they also model those strategies in front of a live classroom of students (McGatha, 2008). This type of coaching provides, “ongoing, in-house expertise to teachers who are striving to improve their teaching and their students’ learning” (Feiler, Heritage, & Gallimore, 2000, p. 66). Model lessons might also be able to challenge the perceptions that teachers have about their students in the moment and cause them to reflect on the low expectations that they might have set for them.

Second, observing a model lesson could potentially help teachers renew their energy when it comes to their craft, with content specialists acting as a bridge between a theory of learning and the implementation of HQIM within a school. Introducing research-based practices during a model lesson might increase student engagement and get teachers excited about the new HQIM. This, in turn, could increase the percentage of time that teachers spend on grade-level content, leading to improved student learning outcomes. These developments also serve to improve the opinion that teachers form about the content specialist and their ability to support them, leading to more engaging professional conversations in the future.

Finally, model lessons could clarify the manner in which certain HQIM can be used in the classroom, increasing the likelihood that teachers will actually use the resources as intended. This could also have the added benefit of building a more trusting professional relationship between the teacher and the content specialist, as the teacher starts to see that the content specialist has expertise in teaching. These ideas will be examined further in the literature review that follows.

Literature Review

The present study explores whether observing a model lesson increases a teacher's willingness to use high-quality and grade-appropriate instructional materials in their classroom. The research literature uses the terms curricular resources, instructional materials, and curriculum interchangeably. For the purposes of this project, I employ the term high-quality instructional materials (HQIM), defined as a set of resources that provide teachers with daily lesson materials that are rigorous, coherent, and aligned to next-generation standards.

While prior research on the impact of model lessons is scarce, a number of studies do exist that examine adult learning, professional development, and teacher motivation to change their practice. For the purposes of the present study, I will review research that examines the efficacy of high-quality instructional materials and teacher implementation of HQIM. I will then discuss the literature surrounding the well-known challenge of implementing evidence-based practices across sectors and conclude with a presentation of contemporary research about instructional coaching and the role that new types of professional development focused on HQIM play in helping teachers to change their practice.

High-Quality Instructional Materials

Research results have established the important role that high-quality instructional materials play in improving student learning (i.e., Short & Hirsch, 2020; Chingos & Whitehurst, 2012; Ball & Cohen, 1996). While HQIM have been found to directly influence student learning,

they also improve the long-term instructional choices of educators (Chingos & Whitehurst, 2012). For example, Boser, Chingos, and Straus (2015) found that improving the quality of curriculum can be 40 times more cost effective in improving student learning outcomes than reducing class size and hiring additional teachers.

In a field study of 363 middle school math teachers, Jackson and Makarin (2017) demonstrated that implementing HQIM can transform an average-performing teacher into one who is performing at the 80th percentile. The difference between using low-quality instructional materials and HQIM can lead to drastically different learning outcomes (Kane et. al., 2016) and have a larger cumulative impact when used by teachers for multiple years consecutively (Hill et. al., 2008). Others have found that educators who leveraged HQIM were able to engage students at a significantly higher rate when compared to teachers who were using their own materials (Opfer, Kaufman, Bongard, & Pane, 2018).

Based on the results of this existing research, the present study assumes that student learning improves when teachers adopt HQIM in their classrooms with integrity (Short & Hirsch, 2020). Implementing HQIM also assists the efforts of teachers to incorporate recent findings from the cognitive sciences into their work and to focus on the learning process rather than solely on arriving at the correct answer (Eisenhart, 2011).

The implementation of HQIM supports Elmore's Instruction Core, in which he recommends using three main strategies to improve student learning at scale: "You can raise the level of the content that students are taught. You can increase the skill and knowledge that

teachers bring to the teaching of that content. And you can increase the level of students' active learning of the content" (City, Elmore, Fiarman, Teitel, & Lachman, 2018, para. 2). HQIM has the potential to support all three strategies.

A number of other countries have long appreciated the importance of HQIM in preparing students for the knowledge-based economy of the 21st century. Hirsch (2018), for example, reported that the transition away from a high-quality literacy program in France resulted in decreased student learning and increased the achievement gap between middle-class and low-income students. In contrast, the successful implementation of high-quality instructional materials is one reason why many Asian countries do well on international benchmarks. In the Republic of China, the Taiwanese Ministry of Education provides teachers with a 12-year curriculum that encourages creative problem solving (Hoyles, Morgan, & Woodhouse, 1999) and active learning (Hsieh, 1997). Singapore's Ministry of Education has pre-service teachers study national HQIM intensely during their undergraduate careers. With what result? The starting gap "between the designated curriculum and the teacher-enacted curriculum is often very narrow" (Kaur, 2014).

Implementation of HQIM

The successful implementation of HQIM is a challenge for most school leaders. Why? Many teachers have limited understanding about how students interpret and process information and how they eventually develop mastery (MacDonald et. al., 2017). In addition, few

have experienced first-hand the type of inquiry-based learning that they are expected to provide for their students (Short & Hirsch, 2020). Consequently, to help teachers implement high-quality curricular resources in their classrooms, schools need to offer ongoing professional development that is directly aligned to the HQIM (Short & Hirsch, 2020).

Although a great deal is known about the transformative effect that high-quality instructional materials can have on student learning outcomes, many schools and organizations have difficulty implementing these evidence-based practices at scale.

The challenges associated with implementing evidence-based ideas across a number of sectors has a long history. In the business world, for example, misconceptions about the efficacy of research leads many people to reject evidence-based practices in favor of anecdotal experiences (Barends & Rousseau, 2018). In addition, a number of businesspeople also believe that their organization is so unique that research findings do not apply (Barends & Rousseau, 2018).

In medicine, decades passed before public health officials were able to convince doctors about the importance of washing their hands (Davis, 2015). In a more contemporary example, many surgeons refuse to use a checklist before operating believing that to do so would pose a threat to their autonomy (Gawande, 2014). They continue this behavior despite the existence of overwhelming evidence supporting the fact that the use of a checklist before surgery significantly reduces later complications. In general, it takes an average of 17 years before a medical innovation reaches the field at scale (Balas & Boren, 2000).

Gawande's *The Checklist Manifesto* (2014) suggests that so-called errors of ineptitude (i.e., mistakes that are made because people do not make proper use of what they already know) rather than errors of ignorance (i.e., mistakes that are made because a person does not know something) are the real challenge in the modern world. In a similar vein, realizing the value that HQIM brings to our schools does not mean that teachers will automatically change their practice and use it. Even though following the directions provided by the research would allow them to have a tremendous impact on their students' achievement, many teachers fail to do so. Unfortunately, "the practice of teaching has changed little over the course of the last century" (Hattie, 2009, p. 5; Marzano, 2003, p. 4). As Russell et al. (2019) write: "the history of education reform efforts is rife with examples of instructional innovations that falter when attempts are made to implement" (p. 149).

Efforts to implement HQIM, then, often fail for a variety of reasons (Donohoo, 2020). For example, while some teachers "espouse a desire to change their pedagogical practices, they do not actually enact these changes" (Le Fevre, 2014, p. 56). Reeves (2008) has suggested that quality implementation can be achieved only after the majority of teachers leverage HQIM. He further points out that student achievement will only be positively affected after deep levels of implementation are achieved.

Others have suggested that for any implementation initiative to succeed, two things must happen: First, teachers must be provided with effective professional learning experiences. And second, a community of early adopters, willing to innovate and grow together, must be created

(Frank et. al., 2011). Some knowledge about the factors that motivate teachers to change their practice is key to understanding the value of building collective efficacy through networked improvement communities.

Teacher Motivation to Change Practice

As mentioned earlier, the research literature is rich in studies about adult learning as well as models of professional development for educators. However, significantly fewer studies exist examining ways to motivate teachers to implement HQIM long-term. Further compounding the problem is the low degree of trust that can exist between school leaders and teachers that gives rise to a lack of faith in instructional decisions (Carver, 2010). The fact that many administrators do not have a background in a variety of content areas exacerbates this lack of trust.

When asked to implement HQIM, some educators update their pedagogy reluctantly, others are selective about the ideas that they use or ignore them completely (Terhart, 2013). Confirmation bias helps explain the reluctance of some teachers to accept new ideas, as they reject hard evidence in favor of anecdotal experiences. Le Fevre (2014) has suggested that some teachers are hesitant to change because of the psychological toll incurred when realizing that their practice may be ineffective. Risk is another factor: if teachers believe that their job performance might suffer if they try new instructional materials, they will be less likely to use them in their classroom.

Consequently, it is important to examine teacher motivation since, “changing teacher beliefs is an essential, yet difficult, aspect of educational improvement” (Le Fevre, 2014, p. 57). Put simply, if we fail to include teachers in the early stages of a curriculum implementation initiative, it is unlikely that any meaningful long-lasting change in instruction will occur.

The present study is based on this belief: model lessons can help build professional trust by encouraging leaders to “do” rather than “tell.” In all too many schools, teachers are introduced to new teaching approaches or instructional materials during a faculty meeting or workshop. However, they have little or no opportunity to witness the new strategy or HQIM being presented to classes of students in their school in real time.

The idea of learning by doing is not new. John Dewey (1938) contended that people learn through educative experiences. This advice should be helpful to school leaders looking to assist their teachers as they implement HQIM. Teachers will be more willing to try out new ideas when they have professional respect for content specialists. To that end, model lessons provide an opportunity for content specialists to demonstrate to teachers the effectiveness of research-based practices when used with their students (McGatha, 2008). This situation will help content specialists build expert and referent power with teachers, two rather influential types of power (Lunenberg, 2012).

Lave and Wenger (1991) argued that successful learning needs to involve legitimate peripheral participation. Viewed through this social learning lens, content specialists are “embodied exemplars” helping teachers to understand what they are to “become” (Lave, 1996).

Model lessons also help teachers make sense of the role that high-quality instructional materials play in planning for their lessons. This knowledge helps to correct the perception held by many teachers that their school context is unique when compared to other schools, leading them to believe that what works in another school may not work in their specific learning community (Katz, Dack, & Malloy, 2018). The key, then, to motivating teachers to change their practice is the building of collective efficacy.

Bandura suggested that collective efficacy is “a group’s shared belief in its conjoint capability to organize and execute the courses of action required to produce given levels of attainment” (1997, p. 6). Donohoo (2018) applied this idea to schools, adding that “collective teacher efficacy refers to educators’ shared beliefs that their combined efforts can positively influence student outcomes” (p. 15). She further suggested that building collective efficacy leads to higher expectations, enhanced teacher motivation, and helps shape “experiences in positive ways through self-fulfilling prophecies” (p. 29).

Regardless of demographics, the higher the level of collective teacher efficacy, the higher the level of student performance (Goddard, Goddard, Kim, & Miller, 2015; Eells, 2011). Hattie’s landmark study (2009) also found that collective teacher efficacy was one of the most important in-school factors influencing teachers’ motivation to change their practice. To support teachers in their attempt to implement HQIM in their classroom, schools must offer high-quality professional development that deals directly with the new resources.

Next, I will discuss various ways in which schools can support the development of their teachers by: first, examining programs of contemporary professional development, and, second, taking a look at HQIM-specific professional development. The literature review concludes with a brief overview about instructional coaching.

Contemporary Professional Development

To help teachers implement HQIM, schools often provide programs of professional development (Short & Hirsch, 2020). Unfortunately, the quality of these workshops varies widely; only one in five teachers report that the professional development they receive is high-quality (Zubrzycki, 2020). Hammond examined the impact of professional development on the quality of teaching and found that great variability existed throughout the United States (i.e., Hammond, 1995; Hammond, 1996; Hamond et. al., 2009). Other researchers have called into question the effectiveness of traditional teacher development, estimating that workshop-style interventions only improve about 30% of teachers' instruction (TNTP, 2015).

While the most effective form of professional development is one that reflects best-practices from adult learning theories (Jensen, Sonnemann, Roberts-Hull, & Hunter, 2016), Desimone (2011) found that teachers need to be actively involved for genuine professional development to take place. Guskey and Yoon (2009) demonstrated that one-off workshops are ineffective and rarely provide embedded classroom support or adequate follow-up.

Although professional development through active learning is more effective, school leaders often invest in passive workshops (Hammond, 1996). One research team noted that most workshop-style professional development opportunities for teachers are discrete one-off sessions that are not connected to their classrooms (Hammond et. al., 2009). Other research has found that these workshops rarely change teacher practice or improve student learning (Yoon et. al., 2007).

The results of a number of recent studies confirm the importance of professional learning that is curriculum-based and content-specific (Short & Hirsch, 2020; Desimone & Garet, 2015). This type of learning encourages teachers to improve their pedagogy and expand their content knowledge while challenging any possible fixed mindsets along the way (Short & Hirsch, 2020). Learning of this nature also helps teachers better understand the design and intended use of HQIM, increasing the likelihood that the curriculum will be implemented (Marzano, 2003). The members of one research team put it this way:

“If you raise the level of content without changing the level of knowledge and skill that teachers bring to the content, you get what we see with considerable frequency in American classrooms: low-level teaching of high-level content. Teachers assign high-level text or complex problems, and then structure student learning around fill-in-the-blank worksheets or walk students through a straight procedural explanation of how to find the answer, leaving the students in the role of recording what the teacher says” (City, Elmore, Fiarman, Teitel, & Lachman, 2018, para. 3).

This observation is in keeping with principles found in Elmore’s instructional core and reinforces the notion that professional development must be curriculum-based. Otherwise, teachers might adopt the rigor of the curriculum but fail to change their teaching practice, leading to low-level teaching of high-level content.

Model lessons are an excellent example of curriculum-based professional learning. They enhance the understanding of teachers about the intended use of the HQIM, thus increasing the likelihood that teachers provide high-level teaching of high-level content. Hammond et. al. (2009) found the professional development that focuses on concrete, everyday challenges faced by teachers and students rather than abstract theories has a greater impact on teaching and learning. Desimone and Garet (2015) also pointed out that to be an effective means of professional development, model lessons must be explicitly connected to daily classroom lessons.

To this end, many districts have leveraged content specialists to support their teachers via individualized instructional coaching. In the present study, content specialists led the lessons they taught in the classroom of the teacher with whom they were working and focused on the daily challenges faced by that teacher, thus rendering them an effective means of professional development.

Instructional Coaching

Instructional coaching is another strategy that schools use to improve their teachers' effectiveness. The results of a number of studies conducted over the past decade support the idea that effective content coaching increases the efficacy of classroom instruction (i.e., McGatha, Davis, & Stokes, 2017; Campbell & Malkus, 2011). West and Staub point out that coaching is a complex and specialized process and that content specialists appear to be most effective in their work of co-planning, modeling and observing the lesson, when their debriefing

takes place with the teacher immediately after the lesson concludes (in Whitehead & Ellington, 2020).

Kraft, Blazar, and Hogan (2018) examined sixty peer-reviewed articles in a landmark meta-analysis and identified school-based coaching as a promising model that struggles to grow at scale. While instructional coaching does appear to improve student achievement, many of the improvements noted were relatively modest. These researchers also noted that instructional coaching had the greatest impact when content specialists engaged teachers in content-specific programs.

These results suggest that coaching is more effective when programs are smaller in nature and focused on specific content areas. Other researchers have pointed out that while “instructional coaching is a promising intervention to support instructional improvement at scale... contextual variations present implementation challenges” (Russell et. al., 2019, p. 175). Kraft, Blazar, and Hogan (2018) ultimately noted that “improving the teacher workforce will require continued innovation in in-service [professional development] programs.”

Other studies have examined the impact that role-playing and practicing lessons have on changing a teacher’s pedagogy (Larson & Tobey, 2020; Gibbons & Cobb, 2017). Whitenack and Ellington (2020) reported that content specialists were more effective when they spent their time modeling lessons each week rather than engaging in the traditional cycle of coaching, observation, and feedback. Their research also found that specialists who built strong relationships with teachers had a greater impact on instruction (Whitenack & Ellington, 2020).

One specialist in their study was statistically more effective than the others. An analysis of the weekly schedules of all the content specialists involved revealed that the positive outlier, in comparison to the other specialists in the study, spent a significantly higher percentage of their weekly schedule modeling lessons in teachers' classrooms.

This result supports the observation of McGatha (2008) that educators benefit when they have a chance to watch an expert teacher lead an exemplary lesson and subsequently have time to reflect on their own teaching practice, as well as the suggestion that teachers need opportunities to develop their pedagogical content knowledge through specific subject-related pedagogy (Gusky & Yoon, 2009; Shulman & Sparks, 1992).

These findings indicate the need for additional study of the notion that the most effective forms of professional development are connected to teachers' planning and teaching (Hammond et. al., 2009). Gulamhussein (2013) has suggested that "modeling has been found to be a highly effective way to introduce a new concept and help teachers understand a new practice" (p. 17). Just as other studies have found that, "professional development focused on specific instructional practices increases teachers' use of those practices in the classroom," model lessons focus on the implementation of specific HQIM (Desimone et. al., 2002, p. 99).

Summarizing the literature

In summary, the literature supports the notion that the use of HQIM directly influences student learning and improves the long-term instructional choices of educators. Despite this fact,

successful implementation of HQIM remains a challenge for most schools. Several factors help explain this dilemma, among them: misconceptions about the efficacy and applicability of research findings, limited understanding on the part of teachers about how people interpret and process information, the discrepancy that often exists between a teacher's stated desire to change their style of teaching and their willingness to make these changes, a lack of trust between leaders and teachers, and the quality of ongoing professional development.

Research findings also indicate that professional development programs that include active learning are most helpful in effecting change. This is particularly true when these programs focus on concrete, everyday challenges faced by teachers and students rather than abstract theories. To this end, content specialists appear to be most helpful when they focus on a specific content area and work directly with teachers co-planning, modeling, co-teaching, observing lessons, and debriefing immediately afterwards. Modeling has been found to be an effective way to introduce new concepts and practices. Professional development that focuses on specific instructional practices increases a teacher's use of the same practices while teaching.

This capstone project examines the hypothesis that model lessons provide a promising strategy to build collective efficacy and support teachers' motivation to change and may serve as a viable strategy for leaders looking to implement HQIM.

Conceptual Framework

To examine the effectiveness of model lessons as a strategy for improving the adoption of new materials by IP, the present study utilizes Donohoo's (2020) understanding of collective

efficacy, a term she uses to describe the shared belief of educators that they could influence student outcomes for the better by combining efforts (Donohoo, 2017). A meta-analysis of over 1,500 studies found that collective efficacy among teachers is one of the most influential factors effecting student achievement (Donohoo, Hattie, & Eells, 2018).

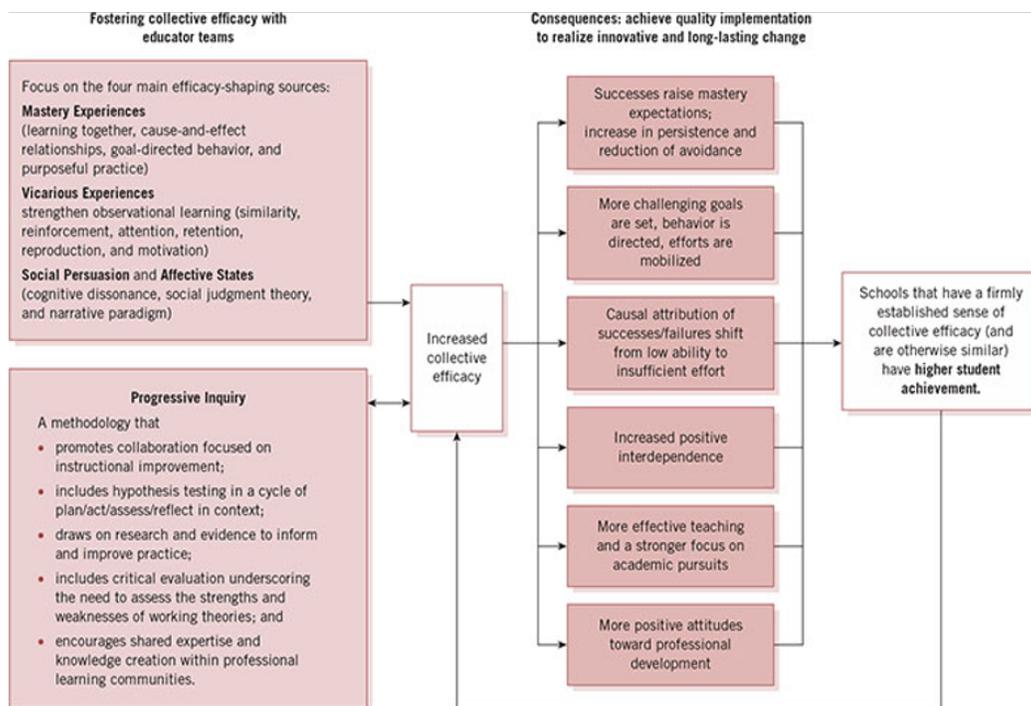


Figure 2: Conceptual Framework

Donohoo’s framework suggests that in addition to social persuasion, there are two ways for schools to build collective efficacy: through vicarious experiences and the creation of mastery moments. A vicarious experience occurs when a team of teachers becomes knowledgeable about a [curriculum] by seeing it performed by others (Donohoo, 2020, p. 59). While this “performance” can take place in a variety of settings, increasingly videos of teaching practice, now widely available, are being used. However, model lessons may be especially helpful when they take place in an environment similar to that of the teacher.

Bandura (1998) observed that “seeing people similar to oneself succeed by perseverant effort raises observers’ beliefs in their own abilities” (p. 54). Furthermore, Donohoo (2020) notes that “the more similar the context, the challenge, or task at hand to the observation team’s lived experience, the more influential the vicarious experience will be in fostering a sense of efficacy in observers” (p. 61). Model lessons, then, might be an ideal vicarious experience, especially when they take place within the context of the teacher’s school. Since model lessons focus primarily on providing teachers with this vicarious experience, the “mastery moments” and “social persuasion” aspects of Donohoo’s conceptual framework are omitted from consideration in the present study.

According to Donohoo (2020), the most effective teacher teams engage in progressive inquiry, including developing common goals, working collaboratively to achieve those goals, and engaging in a culture of feedback while tolerating the discomfort of the process as it unfolds. In the current study, teachers use progressive inquiry to see how their students respond to the content specialist leading a model lesson in real time. Consequently, learning through observation, they come to question their beliefs about student outcomes.

This experience of a model lesson, then, can serve to challenge their pre-existing low expectations and motivate them to think differently about their craft, thus helping them to shift their perceptions and come to realize that the new HQIM is appropriate for their students and not too rigorous. These model lessons can also help teachers better understand the design intentionality of the HQIM.

As a result of this process of progressive inquiry using a model lesson taught in their own school, teachers may start to change their perceptions about HQIM. Following some initial success, teachers begin to set higher goals for both themselves and their students. Witnessing first-hand the impact of the new HQIM helps teachers to improve their perceptions about professional development and helps them to be more effective in the classroom.

Over time, as these teachers come to rely more on one another, their need for the help of a content specialist decreases, and they start to believe that their combined efforts are responsible for better student outcomes. This newly built collective efficacy supports Elmore's instructional core, which simultaneously improves the rigor of the content students are exposed to while increasing the pedagogical content knowledge of the entire team. This result gives rise to schools that have a firm sense of collective efficacy in the implementation of new HQIM, resulting in higher student achievement.

Nevertheless, some teachers may continue to have low expectations for their students and fail to understand the intended use of the new HQIM. With what result? Negative perceptions about HQIM. While many schools attempt to support these teachers by offering workshops and other ongoing educational experiences, the literature suggests that these efforts might not lead to the intended outcome of transformative change. Accordingly, the question remains unanswered: what steps can school districts and organizations like IP take to increase the likelihood that teachers use their new HQIM with their students in the manner intended?

Research Methods

The literature review above highlights the fact that significant research exists examining teacher's perceptions about HQIM, and their motivation to implement new ideas from the research literature. However, to date, no study has been reported in the literature that directly examines the impact of a model lesson on teachers' perceptions and use of HQIM. A model lesson has the potential to provide teachers with an ideal vicarious experience leading them to engage in progressive inquiry. The idea is that this experience will challenge teachers' perceptions (and mindsets and expectations) in the moment, leading to an "aha-moment" about the HQIM. This outcome is especially true if the model lesson takes place in the school in which the teacher is currently employed, using a class of their current students.

Research Questions

The current study explores the use of model lessons as a strategy to be used by content specialists whose aim is to implement HQIM among the teachers they serve. The following two research questions are explored:

- RQ1: How does the experience of a model lesson influence teachers' perceptions of grade-appropriate and high-quality instructional materials?
- RQ2: Are teachers who observe model lessons with students in their school more likely to use grade-appropriate and high-quality instructional materials in their classrooms, compared to teachers who did not see a lesson modeled in their school?

Research Design

This project was conducted in a large urban Midwestern school district currently in the process of implementing a new high-quality elementary math curriculum. The study focused on primary school teachers in schools that were being supported by Instruction Partners. Teachers in the experimental group observed a model or co-taught lesson in their classroom with their own students; it was led by a content specialist from Instruction Partners. Those in the control group were not afforded the opportunity to observe a model or co-taught lesson.

All teachers were introduced to and learned about the new elementary math curriculum by participating in a professional development workshop. Initial classroom observations conducted by the IP content specialists identified those who were leveraging the curriculum, the extent to which they were doing so, and how engaged the students were in each of their classes. For logistical reasons with the partner organization during the global pandemic of 2020, only teachers that observed a model lesson or experienced a content specialist co-teach a lesson were given a survey, which was co-developed with Instruction Partners (*see Appendix A*).

In order to address RQ1, pre-and post-survey data was analyzed to determine the impact that model lessons had on teachers' perceptions of grade-appropriate and high-quality curricular resources. Specific questions in the survey were also examined to better understand the perceptions held by teachers participating in the study. Among these questions were the following: #7 (coaching cycles with my coach help me improve teaching), #10 (the curriculum is helping my students learn), and #11 (I understand how to use the curriculum). To identify

qualitative components of the model lessons that teachers found most beneficial, virtual interviews were conducted by the content specialists from IP who had modeled the lessons (see *Appendix B*).

Whereas RQ1 focuses on teachers' perceptions of HQIM, RQ2 examines the impact of those perceptions on teacher practice. Using principles found in their Instruction Practice Guide (IPG), Instruction Partners recorded pre-and-post-classroom observation data. The IPG is nationally normed thus ensuring that Instruction Partners' content specialists report similar information across a wide array of communities and school districts.

The current investigation focused on two concerns of the IPG: the appropriateness of the enacted standards and of the curriculum. Using this comparison, I was able to determine whether teachers who observed model lessons with students in their school were more likely to use grade-appropriate and high-quality curriculum in their classrooms when compared with those teachers in the control group.

Data Collection

Fifty teachers in four target schools were involved in the study. Surveys were sent out via email by IP and were completed using an online survey tool organized by IP. Thirty-nine teachers returned the pre-survey, and 33 of the 50 completed the post-survey. Due to data sharing agreements with the partner organization, it was not able to be determined which of the 33 teachers that returned a post-survey completed a pre-survey, as well.

IP content specialists observed each classroom and rated each teacher according to the IP classroom observation guide. Based on the review of the literature, I developed an interview protocol (see *Appendix B*) and conducted three individual interviews with content specialists who had either led model lessons or co-taught with teachers in their classroom. These interviews were conducted digitally using Zoom. The latter were also recorded after obtaining the explicit consent and permission of each content specialist and were transcribed and analyzed with the aid of an online transcription tool called Otter.ai.

Survey and interview results were complemented by a dataset from an online HQIM that allowed me to track HQIM usage in each classroom, regardless of whether or not an IP content specialist was present. As many HQIM are now offered online, it is easier to track whether teachers are actually using the materials, regardless of whether a content specialist is observing their classroom or not. Thus, I was able to determine if teachers used the HQIM over time.

The combination of this quantitative data with qualitative data from classroom observations allowed me to determine if teachers who observed model lessons with students in their school were more likely to use grade-appropriate and high-quality instructional materials in their classrooms, when compared to teachers who did not witness a model lesson from a content specialist. Due to information sharing agreements with the partner organization, it was not possible in the current study to align the survey data with the classroom observation data or the HQIM usage data.

Results

This study set out to answer two questions. First, RQ1: How does the experience of a model lesson influence teachers' perceptions of grade-appropriate and high-quality instructional materials? And secondly, RQ2: Are teachers who observe model lessons with students in their school more likely to use grade-appropriate and high-quality instructional materials in their classrooms, compared to teachers who did not see a lesson modeled in their school?

Four instruments were employed in the course of the investigation: survey analysis, individual interviews, classroom observations, and HQIM usage data. The study's results are summarized and discussed below.

RQ1: Teacher's Perceptions

An analysis of survey data suggests that the intervention of a model lesson improves teachers' understanding of how to use the curriculum. For example, prior to the use of a model lesson, 69% of teachers reported that they understood how to use the HQIM; after the intervention, 91% reported a good understanding about how to use the HQIM in their classrooms. Full survey results appear in Table 1, found in *Appendix C*.

The model lesson appears to have had the biggest impact on those teachers who originally reported a lack of understanding about the use of the HQIM, as the biggest shift in survey data came from the teachers that originally reported being unsure of how to use the HQIM. Following the intervention of a model lesson, all teachers reported some increased understanding about how to use the curriculum in their classroom. These results suggest that the

use of a model lesson may have the greatest impact on teachers who are struggling to understand the design intentionality of new HQIM, but this also may be because these teachers had the most to grow. This data can be found in Table 1 in *Appendix A* and is summarized in Figure 3 below:

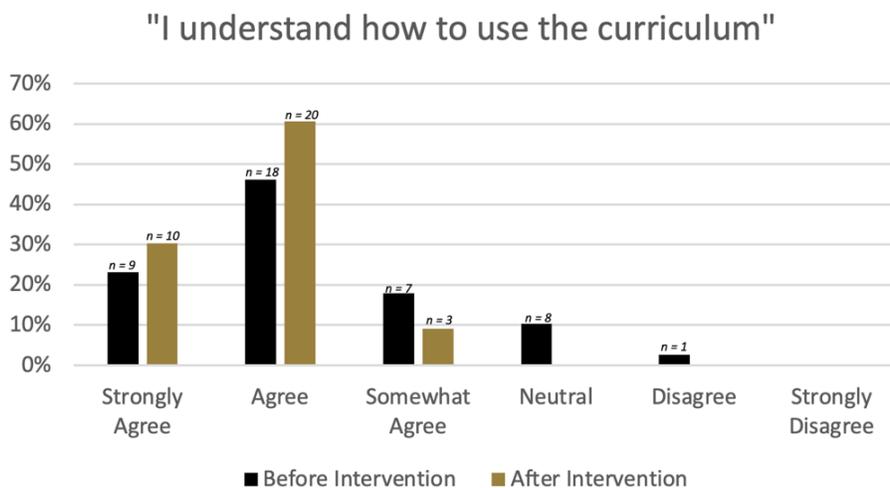


Figure 3: Survey Question 11 results

Data collected in individual interviews suggest that model lessons help teachers understand how to use the curriculum by supporting their “interpretation” of HQIM (i.e., their understanding about how to implement a particular curricular resource for a specific classroom). For example, one teacher in the study admitted that she did not comprehend what aspects of rigor were and failed to understand how to internalize the lesson. One content specialist noted that one of their teachers mentioned that they, “never actually read through a whole lesson,” and thus did not understand the design intentionality of the HQIM. As such, they did not know how to “interpret” the curriculum, presenting a major obstacle when schools leveraged a new set of HQIM.

Whereas model lessons appeared to help with the intended pedagogy, expectations, perceptions, and pacing concerns, lesson internalization meetings provided teachers with an

opportunity to engage with the curriculum on a conceptual basis. These planning meetings increased the likelihood that teachers would begin to understand the purpose of the HQIM.

In an interview, an IP content specialist noted how model lessons helped teachers to understand “the trajectory and purpose of the curriculum.” Paired alongside other activities, such as collaborative planning sessions and lesson internalization meetings, model lessons can help support teachers’ understanding about the use of the curriculum in their classroom. As one IP content specialist reported:

“the day after the model lesson, we had a coaching meeting, where [the teacher], myself, and her coach all met together. And the purpose of that meeting was really to think aloud about how I planned for that particular lesson, with the goal of, one, helping her to better understand how she could take some of those planning moves into her own lessons moving forward. And the secondary goal of helping the teacher to understand the purposes of the curriculum”

Another content specialist continued, noting that model lessons:

“made [the HQIM] feel manageable. I am particularly thinking about one instance of a model lesson that I conducted with a sixth-grade teacher at [school redacted]. She was a teacher who was utilizing the curriculum, but I think didn't feel comfortable enough about where she could or couldn't make edits. And she was thinking about what prior knowledge her students had, or even just, you know, her kids loved talking in groups. And using the sixth-grade curriculum, there's not necessarily scripted moments [for small group conversations]. So I think [the model lesson] felt feasible to her that someone could teach side by side with her and actually make these words on a page come to life in a way that wasn't a robotic reading of the lesson. And I think secondly, [model lessons] also infuse the additional mindset of ‘my kids can.’ I think that's been a common thread throughout all model lessons.”

This last idea highlights the fact that model lessons can challenge low expectations held by teachers in the moment. One content specialist noted that a model lesson helped “teachers suddenly see that with my kiddos, [implementing this HQIM] is possible.”

This idea was further supported by survey data measuring teachers' perceptions about student learning with the new HQIM, with model lessons appearing to have a positive impact on teachers' perceptions about their ability to help their students learn. The full results are summarized in Table 3, found in *Appendix C*.

The use of a model lesson as an intervention to support student learning appears to have a greater impact on teachers who, at the outset, had a better understanding of the design intentionality of the new HQIM. While the majority of teachers reported greater understanding about the manner in which the curriculum can have an impact on their students' learning, a few reported a decrease in their understanding, due possibly to the efficacy of the specific model lesson that was observed. This finding suggests that model lessons may have an impact on different teachers in different ways; this point will be explored further in the discussion section to follow. The data illustrating this last point appear in Figure 4 below:

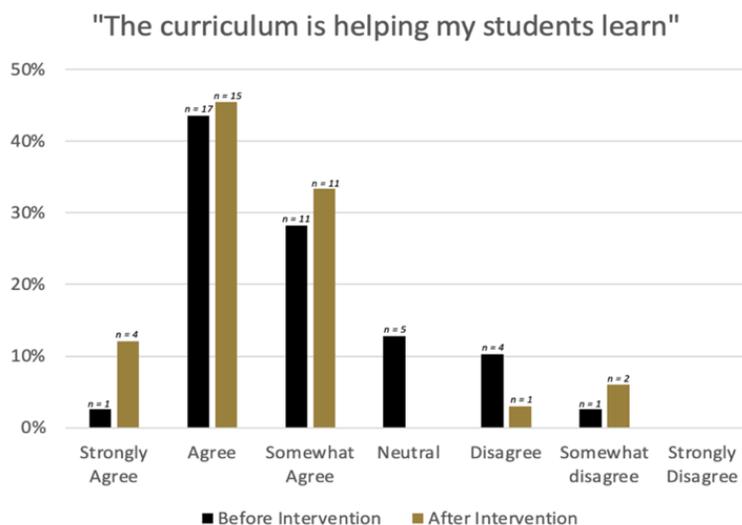


Figure 4: Survey Question 10 results

Finally, survey results indicate that model lessons enhanced the professional relationship between teachers and their instructional coaches. Although initially outside the scope of this

study, I found that teachers were more willing to agree with this statement: “Coaching cycles with my coach help me improve my teaching” following the intervention of a model lesson. This result suggests that model lessons increase professional trust between teachers and coaches. As a result, teachers begin to realize that coaching can improve their performance over time; full survey results appear in table 4, found in *Appendix C*.

These findings were confirmed in individual interviews. In all those conducted, it was evident that model lessons increased the likelihood that teachers would view the specialist as an instructional expert who was knowledgeable about their content. One IP content specialist noted that initially, some teachers struggled with “the power dynamics of having a coach” and noted further that “every time I've done a model lesson with a teacher, it has been the number one way to build that professional relationship and to establish trust and vulnerability.”

Trust and vulnerability are essential elements in any teacher-coach relationship and increase the effectiveness of coaching sessions. Having a solid teacher-coach relationship also helps explain why teachers report greater understanding about the value of the curriculum, and why coaches are able to challenge the false perceptions that teachers have about the new HQIM as well as their expectations about the ability of students to learn rigorous grade-level content. The increased trust forged by the model lesson can also positively impact other aspects of the teacher-coach relationship, allowing the coach to give feedback more freely while allowing the teacher to be more open-minded about any possible feedback.

RQ2: Teachers' Use of HQIM

Next, let us turn our attention to RQ2: Are teachers who observe model lessons with students in their school more likely to use grade-appropriate and high-quality instructional materials in their classrooms, compared to teachers who did not see a lesson modeled in their school? An analysis of data from pre-and-post classroom observations on the part of Instructional Partners demonstrates that model lessons increase the likelihood that teachers will leverage the new HQIM in their classroom.

During one interview, an IP content specialist noted that their team conducts leadership walkthroughs using a normed classroom observation tool to determine whether teachers “are using [the curriculum] with integrity.” Other content specialists informally monitored teachers’ use of the curriculum by establishing “progress monitoring checkpoints” throughout the year as well as during lesson internalization meetings. Another IP specialist noted that model lessons were “really empowering to [the teacher] realizing that the goal of the lesson isn't just to check off the boxes of [things that] I've taught... the goal of the lesson is student mastery.”

To complement this dataset, online usage of HQIM was tracked over time, with a summary provided in Table 4 below. While this online usage does not take into account teachers’ pedagogy, it does showcase whether teachers are using the HQIM or not. These results, illustrating the change that took place in teachers’ HQIM usage over time, following the observation of a model lesson led by a content specialist, are summarized in table 4 on the following page:

Intervention	Summated time spent using HQIM for 30 instructional days before Intervention	Average time spent using HQIM for 30 instructional days before Intervention	Time spent using HQIM for 30 instructional days after intervention	Average time spent using HQIM for 30 instructional days after Intervention	Average Difference before and after intervention
Model Lesson Group	47,963 minutes	1,598 minutes per teacher	58,681 minutes	1,956 minutes per teacher	357 minutes
Control Group	38,118 minutes	1,270 minutes per teacher	32,940 minutes	1,098 minutes per teacher	-172 minutes

Table 1: Online HQIM teacher usage data

This study found that a significant difference existed in time spent on HQIM for teachers who experienced a model lesson ($M = 327.23$, $SD = 527.025$) versus those who did not see one ($M = -172.6$, $SD = 469.831$), $t(48) = 3.8775$, $p < .01$, $d = 1.001173$. These results suggest that teachers in the study who had the opportunity to observe model lessons with students in their school were more likely to use grade-appropriate and high-quality instructional materials in their classrooms when compared to teachers who did not see a model lesson.

Taken altogether, examination of the survey data, classroom observations, individual interviews, and online HQIM usage leads to the conclusion that observing a model lesson with students in their school improved teachers' perception of HQIM by ~12% and increased the likelihood that they would leverage their new HQIM in their classroom moving forward.

Let us now turn our attention to actions that I would recommend to Instruction Partners and discuss concerns that the organization should weigh as they consider implementing these recommended actions in their updated *theory of change*.

Discussion

In this section, I begin by examining the implications that the findings from this study have for IP and offer organization-specific recommendations. Next, I discuss the impact that model lessons have on Elmore's instructional core, scalability challenges, and other implications for using model lessons in the context of improving school systems. I then consider how school leaders might be able to leverage model lessons for equitable instruction and examine the impact that Covid-19 had on this study. I conclude with several suggestions about areas for further study.

Implications for Instruction Partners

Results of this study suggest that Instruction Partners should update their *theory of change* to include model lessons as part of their curriculum internalization process. In addition to curriculum internalization meetings and other existing service delivery models, IP should consider leveraging model lessons early in the process to increase professional trust between their content specialists and the teachers that they support. Model lessons can serve as a viable coaching strategy leading to an increase in the level of expectation some teachers have for their students. At the same time, model lessons help teachers understand how to use their new HQIM in their classrooms.

In addition, IP should develop ongoing in-service programs for their content specialists that highlight current research and best practices about model lessons. This action would ensure that all leaders throughout the organization have access to this information and are leveraging research-informed practices when supporting their teachers. IP should also consider giving priority to the development of organizational best practices involving model lessons.

More importantly for IP, the findings from the present study suggest that model lessons might be able to increase the speed with which teachers understand the design intentionality behind their new set of HQIM. As stated in the literature review above, this outcome could increase student performance more quickly, thus helping to achieve the vision of Instruction Partners, which is to have “all students having the preparation they need to contribute to their community, achieve economic security, and pursue their dreams.” While these findings are specific to IP, I believe that they may also have broader implications for school and district leaders as well.

Impacting the Instructional Core

In the literature review, I reported that Elmore’s instructional core, described as a viable strategy to improve teaching and learning at scale, is embedded within IP’s *theory of change*. The results of the present study suggest that the introduction of HQIM may enhance teachers’ rigor of content, with model lessons being part of a comprehensive strategy aimed at improving the quality of their teaching. In Elmore’s words, the introduction of HQIM may support the shift of low-level teaching of low-level content to low-level teaching of high-level content. Pondiscio (2021), however, points out that HQIM “doesn’t teach itself.” Model lessons can therefore be used as a means to help shift teachers towards high-level teaching of high-level content.

System-level Improvement

As we move through the early 2020s, some thought leaders are revisiting the standard-based reform movement and realizing that the majority of public-school teachers have not

implemented the standards as they were intended (Polikoff, 2021). It is increasingly apparent that in addition to the standards, teachers need more structured classroom-ready resources, such as HQIM.

In their landmark publication, Polikoff (2021) looked “beyond standards” to the promise of curriculum reform. Polikoff (2021) noted, however, that, “adopting good materials is only half the battle, and maybe not even the most difficult half. Districts adopting good, standards-aligned materials still need to support or convince teachers to actually use them and use them in the ways intended by their authors” (p. 9). The results of the present study suggest that model lessons, led by a content specialist, can be a means to simultaneously support *and* convince teachers to leverage new HQIM in their classrooms.

Scalability Challenges

To leverage the full power of model lessons, content specialists need to be reliable expert teachers who are also humble and knowledgeable about emerging theories of adult development. Put bluntly, content specialists need to position themselves in such a way that the teachers in the classroom realize that the specialists are there to support them and not to “show them what to do.” This distinction is easier to discuss theoretically on paper than it is to execute in-person, especially at scale.

Throughout multiple interviews, various content specialists noted how model lessons need to be framed well and targeted. For example, one content specialist, speaking about resistant teachers, noted that: “what can be a little bit tricky about a group that's not bought in yet is sometimes they almost feel like when they see a model lesson, it feels undoable for them...

and so I think sometimes if they're not at a place of being open to what ideas could come from the model lesson, it might not be the time yet for one, but I think there could still be a lot of power [if done correctly]." This example highlights the possibility that model lessons may well be most helpful for teachers who are "on the fence" about adopting the new curriculum. In contrast, early adopters are likely to jump right in while resistant teachers may need more time to learn about the new HQIM through planning and internalization meetings before the model lesson can be scheduled.

Perhaps most importantly, from a pedagogical perspective, content specialists need to be able to lead highly engaging classroom experiences in a diverse set of situations with high expectations for a group of students that they might have not taught previously. In Singapore, the Ministry of Education refers to these elite teachers as "Principal Master Teachers." However, even in Singapore, a country with a remarkable teacher development program and a high level of educational performance, only a very small percentage of teachers ever become "Principal Master Teachers." It remains to be seen how we, too, can develop here in the United States a cadre of these "Principal Master Teachers." The work being done by some large charter networks working to reproduce the Singapore model in individual cities here in the United States is one promising sign of progress in this area (Pondiscio, 2019).

Graham (2013) called for organizations to initiate complex change by doing things that initially do not scale. This strategy encourages organizations to find ways to scale new ideas – such as model lessons – in innovative ways. The results of the present study suggests that while, at the outset, non-profit organizations and school districts may have a limited capacity to initiate model lessons through instructional coaches, over time they can improve the efficacy of the

entire system thus vastly increasing the number of educators that are able to lead a viable model lesson for other teachers. What, at first, may appear to be an unscalable solution can very well become scalable after several years of successful implementation.

Leveraging Model Lessons for Equitable Instruction

While education has traditionally been considered politically neutral, a more critical analysis of teaching practices and curriculum reveals a legacy that centers on white heteronormative culture (Snapp, McGuire, Sinclair, Gabrion, & Russell, 2015). As more educators become aware of this reality, they have pushed their school districts to provide students with an education that will empower them to challenge the status quo and leverage their education to make their world a more just place. Most contemporary researchers credit Freire (1968) with introducing the ideals of critical pedagogy to the mainstream.

While Freire discussed, in broad strokes, the purpose of a transformative education, Ladson-Billings (1995) advocated for the use of a culturally relevant pedagogy, including a culturally responsive curriculum. Prior research suggests that the implementation of a culturally responsive curriculum has a transformative effect on students and positively influences the academic achievement of marginalized students, as well as their comfort at school and overall well-being (Gay, 2010; Castagno & Brayboy, 2008; Kanu, 2007; Curtis, 1998).

Unfortunately, many mathematics and science teachers are both unaware of and ill-equipped to enact these ideals in practice (Frankenstein, 1987), contributing to a researcher-practitioner divide. While some espouse a desire to “develop an increasingly critical sociopolitical

consciousness and come to understand the roots of injustice” using the tools of schooling, many fall back on practices that perpetuate the status quo (Gutstein, 2016, p. 456).

Model lessons may have use as a strategy to help support teachers in this liberation movement. Witnessing big ideas modeled in front of students can afford teachers an opportunity to connect theory with practice more effectively. In addition, as more schools look to implement HQIM focused on equity, diversity, and inclusion, content specialists can consider ways in which they can model equity, diversity, and inclusion efforts across different content areas, leading traditionally marginalized communities to embrace school change initiatives (Levitan & Johnson, 2020).

Covid-19

This study was conceptualized prior to the 2020 COVID-19 pandemic when the novel coronavirus disrupted education throughout the United States. One report, entitled “13,000 School Districts, 13,000 Approaches to Teaching During Covid,” discussed the wide variety of teaching practices that were used during the pandemic (Taylor, 2021). Many schools throughout the country moved to a fully virtual teaching modality, resulting in students not being physically present in school for more than 18 months.

While many students demonstrated greater responsibility and resiliency during this period, traditional learning pathways were disrupted for most. At least one initial analysis of the situation suggested that the so-called "COVID slide" was significant, with the actual impact on

learning differing markedly based on a variety of demographic conditions (The World Bank, 2020).

The efficacy of model lessons may very well have also been affected by the pandemic. Many teachers reported that the shift to distance learning gave rise to one of the most stressful periods in their professional career (Federkeil, Heinschke, & Klapproth, 2020). The long-term effects of this situation have yet to be understood. Results from the present study should be viewed within the context of the global pandemic, especially as many of the model and/or co-taught lessons were completed virtually over the internet.

Areas for Further Study

This study examined the impact that high-quality model lessons and co-teaching had on teachers' perceptions and use of HQIM. Further study is needed to determine how often model lessons should be used to support teachers in their efforts to implement HQIM, and for which types of teachers and under what set of circumstances.

The study also focused on the use of HQIM. Less clear is the degree to which model lessons would impact other educational change initiatives, such as supporting teachers who are struggling with classroom management or implementing new school-wide initiatives. Further research could also help determine what percentage of a content specialist's time should be spent on model lessons, as well as the best way to leverage the content specialist's expertise throughout the course of a school day.

While this study explored the impact of model lessons on teachers' perceptions of HQIM, further research on the effect that model lessons have on school leaders' perceptions of HQIM would also be valuable. While Polikoff (2021) suggests that HQIM is a relatively new idea in education reform, others note that "while there are numerous studies examining teachers' perceptions with regards to curricular reform, there is little known about school leaders' beliefs, perceptions, and experiences throughout such change processes" (Bauer, Lehmann, Reed & Zimmermann, 2021, p. 3). Many school leaders may not yet see the value of HQIM and, thus, are ill-equipped to help their teachers' implement it in their classrooms. This new focus for school leaders in supporting the implementation of HQIM makes their already stressful roles even more complex (Bauer, Lehmann, Reed and Zimmermann, 2021).

Not a panacea

While model lessons may serve as an effective school improvement strategy, it has been duly noted that, "there are no panaceas for the ills of our public education system. Decades of segregation and inequality, both deliberate and accidental, cannot be overcome with any single policy change" (DeRoche, 2020, p. 25). Polikoff notes (2021) that, "even a curriculum-oriented reform will not get us where we need to be if we do not also challenge educational structures that impede reform, segregate students, and deprive our most disadvantaged students of the resources and teachers they need to succeed" (p. 2).

Conclusion

In the introduction, I mentioned that during my third year as a teacher I was exposed to a new high-quality math curriculum for the first time. While this new HQIM eventually transformed my classroom, it took me time to implement these resources as intended. Like other teachers, I questioned the design intentionality and wondered if the new HQIM were too difficult for my students. I might very well have given up on the new HQIM if a content specialist had not come into my classroom and offered to lead a model lesson in front of my students.

That day was transformative for me and led to some of my most rewarding years as a teacher. That model lesson changed my perception of the role that HQIM plays in our schools. My hope is that every teacher has the opportunity to observe a content specialist lead, in front of their students, a model lesson with HQIM. Such an experience would, I believe, lead to significant improvement in our public schools, once and for all.

Appendix A: Survey

Survey Question #1: Making mistakes is considered part of the learning process in our school.

Strongly Agree Agree No Opinion Disagree Strongly Disagree

Survey Question #2: In this school, teachers feel comfortable experimenting with untried teaching approaches, even if the approach might not work.

Strongly Agree Agree No Opinion Disagree Strongly Disagree

Survey Question #3: How frequently does your coach observe in your classroom?

Weekly 2-3 times per month Once per month Less than monthly Never

Survey Question #4: Has your coach worked with you on new instructional techniques?

Yes, and I have been able to implement them with success.

Yes, but I am not yet able to implement them with success.

No, but we have not worked on new instructional techniques.

Survey Question #5: My coach provides opportunities for me to reflect honestly on my practice.

Strongly Agree Agree No Opinion Disagree Strongly Disagree

Survey Question #6: My coach is a champion for equity in our school and intentionally engages teachers in conversations and learning to safeguard students from racism and other forms of bias

Strongly Agree Agree No Opinion Disagree Strongly Disagree

Survey Question #7: Coaching cycles with my coach help me improve my teaching.

Strongly Agree Agree No Opinion Disagree Strongly Disagree

Survey Question #8: If a child doesn't learn something the first time, teachers will try another way.

Strongly Agree Agree No Opinion Disagree Strongly Disagree

Survey Question #9: Teachers in my school are confident that they can motivate students.

Strongly Agree Agree No Opinion Disagree Strongly Disagree

Survey Question #10: The curriculum is helping my students learn.

Strongly Agree Agree No Opinion Disagree Strongly Disagree

Survey Question #11: I understand how to use the curriculum.

Strongly Agree Agree No Opinion Disagree Strongly Disagree

Survey Question #12: I engage in lesson internalization.

Every lesson Most lessons Never

Appendix B: Interview Questions

1. What was your initial experience like when the school(s) you were supporting first adopted the new HQIM?
2. What was your experience like when you led a model lesson in another teacher's class with their students?
3. How did the model lesson impact the teacher's perspective on the new curriculum?
4. What are other on-going challenges that the teachers you are supporting are having with the new curriculum?
5. Is there anything else that you would like to add?

Appendix C: Tables of Survey Results

Survey Question 11: I understand how to use the curriculum.

	Before Intervention <i>n</i> = 39	After Intervention <i>n</i> = 33	Difference
Strongly Agree	23.08%	30.30%	7.23%
Agree	46.15%	60.61%	14.45%
Somewhat Agree	17.95%	9.09%	-8.86%
Neutral	10.26%	0%	-10.26%
Somewhat Disagree	0%	0%	0%
Disagree	2.56%	0.00%	-2.56%
Strongly Disagree	0%	0%	0%

Table 2: Survey Question 11 results

Survey Question 10: The curriculum is helping my students learn.

	Before Intervention <i>n</i> = 39	After Intervention <i>n</i> = 33	Difference
Strongly Agree	2.56%	12.12%	9.56%
Agree	43.59%	45.45%	1.86%
Somewhat Agree	28.21%	33.33%	5.13%
Neutral	12.82%	0.00%	-12.82%
Disagree	10.26%	3.03%	-7.23%
Somewhat disagree	2.56%	6.06%	3.50%
Strongly Disagree	0.00%	0.00%	0.00%

Table 3: Survey Question 10 results

Survey Question 7: Coaching cycles with my coach help me improve my teaching.

	Before Intervention	After Intervention	Difference
Strongly Agree	38.46%	30.30%	-8.16%
Agree	43.59%	63.64%	20.05%
Somewhat Agree	10.26%	6.06%	-4.20%
Neutral	7.69%	0.00%	-7.69%
Disagree	0.00%	0.00%	0.00%
Somewhat disagree	0.00%	0.00%	0.00%
Strongly Disagree	0.00%	0.00%	0.00%

Table 4: Survey Question 7 results

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