High Quality Professional Development in Charter Schools: Barriers and Impact

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This case study examines how a charter school overcame obstacles to offer professional development aligned with research based best practices and how that program impacted teacher behavior and student outcomes. Staff interviews were conducted and documents were analyzed in order to determine the characteristics and impacts of professional development. Data analysis revealed the presence of a teacher driven, best practice aligned program that had positively impacted teacher practice and job satisfaction as well as student engagement. Unique barriers to planning and delivery of the program due to the charter school environment were identified as: (1) financial constraints, (2) time constraints, and (3) teacher attitude.

Charter schools represent a relatively new but quickly growing segment of K-12 education in the United States and are a central tenant to many reform agendas. The charter school movement began when the first charter establishment law passed in Minnesota in 1991 and has since grown quickly. The National Alliance for Public Charter Schools (2017) estimates there to currently be over 6,000 charter schools serving about 2.57 million students, which is about 4% of the student population in the United States. The rapid growth of charter schools and increasing numbers of students served by them creates urgency around a set of questions regarding why some charter schools are successful and others are not. What commonalities do successful charter schools share and how to those characteristics contribute to student success? The research in this field is in its infancy, but is of importance given the increase in number of schools that open every year and numbers of students served in them. Although there are many characteristics that may lead to charter school success, high quality teacher professional development is one that provides promise.

The purpose of this case study is to examine how one charter school worked through systemic barriers unique to the charter environment to plan and offer professional development aligned with best practices as described in recent research. In addition, this study examines the impact of high quality professional development on teacher attitude and behavior and student outcomes.

Literature Review

Not all charter schools have lived up to the promise of a more effective type of school and in fact, they are no more likely than traditional public schools to positively impact student achievement. The Center for Research on Education Outcomes at Stanford University (2009), found that when charter students are matched demographically with their public school counterparts, only 29% outperform traditional public schools in math and only 25% outperform traditional public schools in reading. Much of the challenge for charter schools is rooted in the characteristics and quality of the teachers.   Charter school salaries are often lower than their traditional public school counterparts and teachers are more likely to be uncertified, not have a master's degree or have less experience than teachers at traditional public schools (Cannata & Penaloza, 2012). Stuit & Smith (2006) noted that teacher turnover is much higher in charter schools because teachers are more likely to be young, inexperienced, and dissatisfied with working conditions. In addition, the required use of complex instructional strategies mandated by many charter contracts can create challenging conditions for teachers who lack experience and certification and may lead to dissatisfaction, and turnover.

A traditional school district would likely have the capacity to overcome problems presented by inexperienced and uncertified teachers through established systems of mentoring and professional development.   In order to meet system reform goals of increased student achievement, many states have created policy initiatives that require mentoring for new teachers in traditional public schools that pair the new teacher with a successful, experienced teacher (Mullen, 2011). These types of mentoring situations have proven successful in reducing teacher turnover and increasing teacher skills when teachers are given emotional, logistical and communal support from experienced peers (Strong, 2005). Implementing these types of mentoring relationships in charter schools may prove problematic because of the high numbers of inexperienced teachers typically hired. Furthermore, in an independent, start-up charter, every teacher is new to the

school. In these cases, charters must rely on professional development rather than mentoring to support teacher skill development and teacher retention.

The effects of teacher professional development on gains in student learning have been studied in depth over the past decades in traditional public schools but there is little similar research conducted in charter schools that operate under different conditions. In research commissioned by the Council of Chief State School Officers, Blank & de las Alas (2009) conducted a meta-analysis of 74 studies focused on the effects of professional development for K-12 teachers of science and mathematics. This study confirmed that high quality professional development does have a significant impact on student achievement. In addition, teachers who engage in sustained professional development are more likely to implement a specific teaching methodology, as if often required in a charter school, with greater fidelity than those who are untrained. Hixson, Ravitz, & Whisman (2012) studied the influence of teacher professional development on the implementation of Project Based Learning (PBL) and found that teachers who received professional development were significantly more likely to implement the instructional methodology than teachers in the control group.

Much is also known about characteristics of high quality professional development programs that are likely to result in improved student achievement. In 2013, the West Virginia Department of Education conducted a meta-analysis that identified an emerging consensus on professional development implementation characteristics that enhance teachers' use of new knowledge and skills in their classrooms, thus leading to improved student outcomes. According to their study, high quality professional development has the following characteristics:

- content focused with learning that deepens subject area knowledge and related pedagogical approaches;
- coherent instruction that provides experiences in a progression that builds upon skill over time and aligns with school goals;
- an active learning environment that provides teachers an opportunity to plan for implementation;
- provides opportunities for teachers from the same grade level, department or school participate together;
- is of the appropriate duration considering the complexity of the skills being conveyed and includes follow up coaching or instruction (Hammer, 2013).

Although charter school teachers are almost as likely to receive some type of professional development than traditional school teachers, the focus of that training does not tend to align to best practices that cause an increase student learning. Charter school teachers tend to participate in professional development focused on classroom management, teaching English-language learners and teaching students with disabilities. Traditional public school teachers are more likely to receive professional development in their subject matter content, instructional methodologies and use of computers (Goldring, Gray, Bitterman, & Broughman, 2013). The difference in teacher characteristics in charter schools combined with the required use of complex instructional strategies and lack of access to high quality professional development creates a set of circumstances that may be responsible for the lackluster performance of some charter schools. This case study examines the questions regarding the impact of high quality professional development in charter schools, including whether it is a condition that increases the likelihood of student success.

Method

This case study examined professional development planning, implementation, and outcomes at one suburban K-8th grade charter school that draws a diverse student population from the near suburbs of a major metropolitan city in the southeastern United States. At the time of study, the school was in its second year of operation and there were approximately 600 students enrolled with 60 staff members including four administrators and one counselor and 40 teachers. The school was granted its charter contract from the public school district in which it resides, but that district has no role in governance or day to day operations of the school. The charter school operates as an independent entity that is accountable to the school district only for meeting the goals within the charter contract. Governance functions are performed by a ten-person volunteer board of directors that appoints their own members.

The mission of the school is to provide an education based on design thinking and problem-solving with an emphasis on science, technology, engineering and mathematics (STEM) to K-8 children in a diverse community. The overall goal of the school is to prepare children in a way that provides them a foundation to be creative innovators and problem solvers so they are prepared for success and leadership in the rapidly changing world. Given this mission and goal, the required instructional methodology at the school is a complex mix of design thinking and project based learning with a STEM focus. In addition, the school adds one hour to each day to the school schedule, four days per week for a class in innovation for students in all grades and provides a differentiated programming in math, science and literacy. The charter of the school specifically calls for the use of materials from the Singapore Math program and Full Option Science System (FOSS).

Data Collection

Staff member interviews were utilized to gather data regarding the planning, delivery, and impact of professional development. Participants were selected through the solicitation of volunteers. Seven teachers and three administrators volunteered and participated in interviews. The participating teachers included regular and special education teachers, teachers from elementary and middle school as well as gifted teacher and a department chair.

Documents were examined including professional development plans and surveys in order to corroborate data gathered from interviews. Student achievement data in the areas of reading and math were examined by grade level using results from the Northwest Evaluation Association Measure of Academic Progress (MAP) assessment that was administered at the end of the previous school year to all K-6 students.

Research Design

A descriptive qualitative single case study format was utilized to gather and report data in an attempt to answer three questions: (1) What are the barriers to offering a high quality professional development program at a charter school, (2) How can these barriers be overcome, and (3) What is the impact to teachers and students when high quality professional development is offered?

Using case study allows for the description of contemporary phenomenon within the real-life context in which the intervention has occurred (Yin, 1994). The case study format also allowed the researcher to deeply consider a single element within a single system (Stake, 2010).

This study follows Wolcott's (1994) recommendation to increase depth rather than scale with the understanding that a study at a single school prevents the ability to make comparisons across settings. This case study is exploratory in that it is an effort to develop knowledge about a particular phenomenon with the expectation that this information with shape future research including study of the impact of professional development on student achievement in charter schools.

Construct validity was ensured by analysis of multiple sources of data including data from interviews with teachers and administrators as well as review of documents. Documents were reviewed in order to triangulate the data gathered from interviews. Internal validity was ensured as data were collected and analyzed in order to test the theories that a charter school can overcome barriers to offering high quality professional development and when they do so there is an impact to teacher behavior and student outcomes. External validity is often difficult to ensure using the case study method but was considered through the literature review process by searching for similar research. For the purposes of this case study, high quality professional development was defined using the characteristics identified by Hammer in the meta-analysis from the West Virginia Department of Education in 2013.

Analysis of data

Data analysis was guided by elements of constant comparison coding methods as described by Glaser (1965). Interview recordings were transcribed into written documents and those transcriptions were coded into categories based on the characteristics of quality professional development as described by Hammer (2013) in the West Virginia Department of Education study. Teacher and administrator statements were coded into as many different categories as possible while also comparing each statement to the previously coded statements following what Glaser referred to as the "defining rule for the constant comparative method" (p. 439). Additional themes that were not best practices identified by Hammer (2013) were also sought.

Professional development plans and surveys were analyzed according to theme areas to corroborate the data gathered in interviews. Finally, Measure of Academic Progress assessment data were analyzed by grade level to establish the extent of student growth after the first year of operation. Charter schools are public schools supported by tax dollars and therefore, all documents examined were available in the public domain.

Results

Document analysis provided information regarding the structure of the professional development program in place at the school. The school calendar included 11 full teacher work days without students present that were utilized for teacher training. These 11 days included five days prior to the start of the school year and one at the conclusion of the school year with the remainder of the days scattered throughout the year. The focus of training on full days of professional development was utilization of resources and materials required by the charter such as Singapore Math, FOSS science, and design thinking. In addition, students are dismissed from school one hour early one day each week and this time was also utilized for teacher professional development. The training sessions on early dismissal days were collaboratively planned and delivered by the administrative and teaching staff. Staff members volunteered to develop and deliver mission driven training sessions and teachers were free to sign up for any session based on their personal interest or need.

The analysis of the staff interviews and documents resulted in five themes associated with the professional development program at the school, which are discussed in the following sections.

Evidence of High Quality Content Delivered in Training Sessions

A major theme identified in the analysis was the presence of professional development content that aligned with research based best practice and was therefore, most likely to impact student achievement (see Table 1). It was found that professional development in this school served the dual purposes of being content focused with learning that deepened subject area knowledge and also improved teachers understanding of the pedagogical approaches that are specifically called for in the school charter. School professional development plans called for a two stream approach to training. All training related to the mission of the school was mandated for staff and additional training was personalized to the needs of the teacher. At the time of the study, professional development to improve content area teaching had focused on effective use of instructional materials required by the school charter. Teacher A stated, "The all-day professional development workshops are usually our big ticket items like Singapore Math and Foss Science. We have had the trainers come and work with us lots of times so that we really know how to implement." Teacher E added, "We have Singapore Math training in grade level clusters. Generally, it is effective and interactive."

Table 1
Coding Results: Content of Professional Development

Indicator	Teachers (n)	Administrators (n)	Examples
Content focus pd offered	5	3	"At the beginning of the year we focus on overall school needs and those curriculum spots that need work, for example, the math trainer worked extensively with our teacher teams this year."
Pedagogical approach pd offered	7	3	"We have a training session today about how to make thinking visible and that is something I can use in any content area."
Content aligned with mission	7	3	"Innovation training is aligned with our mission and that's what sets us apart from other schools"

All staff interviewed agreed that professional development training sessions were related to the mission and charter of the school. Teacher E said:

> Having innovation training and help is good because we teach innovation lessons that are not in our content area and we are stepping outside of our comfort zone in doing that. I think that it actually helps us strengthen us as teachers to expand a little bit.

Both teachers and administrators mentioned pedagogical professional development as the most typically offered type of training, as well as the most meaningful to their work at the time. Administrator B, who had primary responsibility for planning professional development stated:

> We have done a lot but have so much more to do with design thinking and PBL (Project Based Learning). There are a lot of connections but they are not always completely compatible. The combination is something no one has really done before and this will drive our professional development in the coming years.

Teachers agreed that the complex combination of pedagogical techniques required by the charter had been the focus and highlight of the professional development program at their school. Teacher C said, "Design thinking, differentiation, and making thinking visible have all been fantastic. There are lots of sessions about things you can do in your classroom", the same teacher also said, "What I really like about our sessions is that you come in, get an agenda that aligns with our mission, and you jump right in. There's time to learn and share and it's personalized to what I need."

Evidence of High Quality Structure of Professional Development Training

Elements of high quality professional development structure were also evident in the interviews; however, this theme area was not as strong as the high quality content theme (see Table 2). Teachers and administrators indicated that each of the indicators were present to some extent.

Staff generally felt that instruction had been coherent and that training had provided experiences in a progression that built upon skill over time, but that based on the complexity of the instructional methodologies required in the charter contract, much more training was needed. "Some of our teachers have never seen these things and so we need to start by introducing concepts just to get them underway", said Administrator A. This complexity of the pedagogy was also echoed by Administrator B, "This will take time. PBL and design thinking training take years just by themselves and to marry the two is even more complex. We are also embarking on STEM certification and that is complicated as well." She summarized by saying, "We need to balance the relationship we have with our teachers with the complexity of our mission statement."

Teachers had mixed feelings about the level of active learning that that provided an opportunity to plan for implementation of the new skill and the opportunities for teachers from the same grade level, department or school participate together. Teacher B said, "Our team is scattered at the Thursday workshops because everyone has a choice, but I like it because I don't want to attend something that doesn't apply to me." Teacher C said, "Teams try to meet during times when there are no children here like in the early morning. Other teams seem to find other time to talk like at lunch or when they supervise recess."   The value of additional time for team work was expressed by Teacher D:

A week or so ago, there was a workshop that my whole team chose to attend. It was a time when I felt on an even playing field with the rest of the teachers. It was helpful because I was able to communicate with others and plan how we would use the information.

Table 2
Coding Results: Structure of Professional Development

Indicator	Teachers (n)	Administrators (n)	Examples
Progression that builds over time	4	1	"We have sessions on a cycle so if you need a refresher or repeat, you can choose to go again."
Participation in teacher teams that plan for implementation	4	2	"Training at the beginning of the year is with teams but it is something I would like to see more of."
Follow up coaching	2	3	"Administrators have an open door policy and if you want coaching, you just have to go ask."

That sentiment was echoed by administrators and Administrator B stated, "(Teams working together) hasn't really happened yet except for in content area training. We need to get to that point."

Evidence of Teacher Driven and Personalized Training

The strongest theme noted in the interview coding and document review was the presence of teacher driven professional development (see Table 3). Students at the school were released an hour early one day per week allowing teachers time to attend personalized sessions intended to meet self-identified needs. All teachers and administrators interviewed stated that teachers had a choice about which professional development sessions they attend. Teacher C summarized the approach:

Every Thursday the students are dismissed an hour early and we have that time for professional development and we have flexibility in what we choose. The thing I think is most important is sitting and listening to your colleagues and then being able to speak out about your issues and ideas.

Table 3

Coding Results: Teacher Driven and Personalized Professional Development

Indicator	Teachers (n)	Administrators (n)	Examples
Teacher input into workshop topics	3	3	"I filled out a survey about what sessions I would like to see and many of them have been offered."
Teacher choice in training sessions	7	3	"There are anywhere from 3-5 sessions per week and we have the option to choose."
Option for teachers to deliver workshops	7	3	"It's fun when teachers present and we learn from each other."

Teachers also noted the value in learning from their colleagues. Teacher D stated, "Last year, a lot of times, it was all admin that delivered, but this year they have branched out and asked teachers and that helps with our evaluations as well." Teacher input into the topics for workshops was also corroborated in the document review through analysis of professional development surveys given to teachers.

Teacher driven professional development and personalized instruction is not an element of high quality professional development identified by Hammer (2013) in the West Virginia Department of Education meta-analysis; however, even if it is not likely to impact student achievement, in this case study, it clearly had an impact on teacher satisfaction. Teacher C stated:

I think in the past I may have been hesitant to deliver PD because people just kind of shut down and look at their phones. That isn't the case here. This is a community and everyone is a lifelong learner. Everyone is kind and receptive. It's very welcoming and people value what you deliver to them.

The high level of personalization of professional development did have a downside in that teacher teams did not have a common experience and it did not give teams opportunity to plan for implementation of the skills learned. The need for more time to work with teams was a consistent theme. Teacher A stated, "We share out at grade level team meetings but that's more like maintenance than professional development. It's like a temperature reading where we ask were you able to incorporate that?"

Barriers to High Quality Professional Development

The literature regarding professional development in charter schools indicates that the focus of training does not typically align with practices found to increase student achievement; therefore, administrators in this case study were asked questions about the barriers to planning and implementation of high quality professional development. All administrators discussed their

collective belief about the importance of teacher training and identified money, time, and teacher attitude as barriers that they encountered (see Table 4).

Financial constraints were identified as a barrier that manifested itself in multiple ways. Administrator A stated:

We have financial barriers because we are a new school and so many things need to be done. There are still a lot of moving pieces. We want to make sure we are training the people who will stay with us so we don't make them marketable and then they leave.

The same administrator also noted the lack of money to pay substitute teachers when teachers were in trainings, "Our para-professionals are the only subs we have and if our teachers are off campus or in trainings, we don't have enough people to cover their classes."

Table 4

Coding Results: Barriers to Implementation

Indicator	Teachers (n)	Administrators (n)	Examples
Financial constraints	1	3	"We have less money per student than other schools and so there isn't enough money to do what we want to do. We have to limit and prioritize."
Time	2	3	"Our school day is longer and teachers are paid less. We have to balance it all and not overwhelm them."
Teacher attitude	1	3	"Teachers are so conditioned to not take risks and they have a fear of failure so they don't want to try new things."

Another financial constraint mentioned by both an administrator and a teacher was the inability to pay for teachers to attend outside workshops. Administrator B said:

We don't have the money for teachers to attend conferences and that is a huge limiting factor and one of our biggest challenges. Teachers feel valued when we pay for them to go to a workshop and so this is something we need to add as soon as we can. Fortunately, we applied for and received a huge grant so this will be something we add.

The lack of time for professional development was also noted as a factor that is exacerbated in a charter school. Administrator B said, "Our school day is a few hours longer than the other schools in the county, so time is our number one problem. We don't want to burn out

our teachers and yet, there is so much they need to know. One of the things we have added to help is learning walks that take place during the school day. We were surprised by how excited some teachers were about this opportunity."

Teacher mindsets and attitudes were identified by all administrators as an obstacle to professional development implementation. Administrator C summarized, "I would say a lot of our teachers have been conditioned that the lesson plan is on the desk, the standard is on the board and you do everything in 15 minute increments. Even when we tell them we want them to take a risk and that failure is ok, they have the deer in the headlights look." Administrator A also mentioned the significance of teacher attitude, "Sometimes the teachers are overwhelmed by the complexity of a new school and what we are trying to do and it looks like they are being dismissive. They aren't doing it to be mean, but sometimes they just think they don't need any more training."

The administrators continued to echo their commitment to providing teachers with high quality training, despite the numerous obstacles to doing so. Given their strong beliefs, none of the administrators felt that the barriers they mentioned were insurmountable and each shared strategies that were utilized to overcome them. The large grant that the school applied for and received was mentioned as the most important method to overcome the financial barriers, but creative ideas were also highlighted, "We are planning to open up some of our workshops to teachers at other schools so that we can have more things here on site for our own teachers and then we can offset some of the costs", said Administrator A. She also stated that they are working with vendors to negotiate more training hours as they increase their supply orders.

Administrators also discussed overcoming the barriers to teacher motivation by developing productive relationships with them, modeling what is expected and creating a positive school culture. Administrator B said, "I now have teachers that regularly share their work with me and I'm trying to have that type of trusting relationship with everyone. I model strategies and offer assistance. It's the kind of help I wanted when I was a teacher and we make it fun and active." Administrator A summed up the beliefs of the leadership by saying, "I can understand why many charters do not offer much teacher training. There are so many priorities and so many things get in the way but we have made a commitment to our teachers, families and students to be different and to train our teachers in ways that we think will improve our teachers' skills so that we can live up to the promises in our charter contract."

Impact to Teacher Attitude and Behavior and Student Outcomes

Data were analyzed regarding the impact of professional development on teacher attitude and behavior as well as student outcomes (see Table 5). Staff expressed the belief that the professional development did impact teacher behavior and skills. Administrator A summarized:

> There are times like when we had the MAP testing sessions where our teachers really seemed to get it and it use it and other days where the training doesn't seem to matter. Sometimes we see teachers using the skills but it is not immediate. I know the changes we need won't happen overnight but we are seeing incremental improvements.

Administrator C stated, "I have seen a few teachers try project based learning elements outside of innovation hour. We know they get it when the generalize it to the classes they teach." Teacher C shared a story related to student impact:

> I just happened to hear one of the teachers when she used the visible thinking strategy I taught in a workshop. She has a pretty unruly and uncooperative group of students and they were reading about women in the Middle East and she used the handout I provided.

Every student identified a color, symbol, and image. They did it and they wanted to share their work. It was remarkable and they were all in. The teacher shared with me later that the students handed in work that she did not think they were capable of.

Table 5

Coding Results: Impact on Teachers and Students

Indicator	Teachers (n)	Administrators (n)	Examples
Teachers implement skills taught	4	3	"I am implementing design thinking and I understand the connection to students now."
Teachers deliver content more effectively	2	3	"I know how to creatively use the materials and I'm not stifled by standards anymore."
Increase in student engagement	5	3	"Our students are really responding to positive reinforcement and they are so engaged."

Teachers also indicated that the focus on teacher driven and personalized professional development gave them a sense of job satisfaction that they had not experienced in other public school settings. Teacher B said, "I have been in other places where you have to sit in long training sessions that don't apply to you at all. It's a waste of time. One of the reasons that I like working here is that I get to choose what workshops are most valuable to me." Teacher D said, "I was nervous at first to lead a workshop but I will definitely do it again. I have never been asked to share my skills and ideas with other teachers before and it makes me feel like administrators care about me and value what I do."

Interview coding revealed a consensus that professional development had begun to impact teacher behavior as well as student engagement, but that it was too early to see the impact on students' academic performance. Administrator B stated, "I think it will take us a few years to get data about academic impact, but I have already seen a big impact on the behavior and engagement of our students. I have seen teachers with difficult students use the design thinking strategies instead of worksheets and the level of appropriate engagement has increased dramatically." Administrator C expressed similar sentiment, "When I see students and they stop asking me if their work is good because they know it's good, that's student impact. I have the best job in the world because I see that moment, record it and work to replicate it."

Table 6
Measure of Academic Progress (MAP) Spring 2017 Assessment Results

Grade level	Students with valid score (n)	Above norm Math (n)	Above norm Math (%)	Above norm Reading (n)	Above norm Reading (%)
K	49	37	76%	39	80%
1	40	35	88%	36	90%
2	75	58	77%	62	83%
3	87	66	76%	73	97%
4	75	58	77%	55	73%
5	66	56	85%	48	73%
6	56	42	75%	44	79%

Student assessment data were analyzed as a part of the document review (see Table 6). After one year of instruction at the school, all grade levels performed higher than the national grade level norm scores. This is particularly notable in the early grades where students have had little or no instruction at other schools. In addition, 68% of students enrolled at the school scored at the proficient or distinguished level on the state required end of grade assessments during the previous year of the study, which was their first year of operation. These are promising early results but further data will need to be gathered over the coming years definitively connect student performance to the professional development of teachers.

Discussion

As noted, charter school teachers are less experienced and less likely to hold a teaching certificate than their traditional public school counterparts. According to the National Center for Education Statistics (2011), 30% of charter school teachers were in their first three years of teaching and 75% have taught for less than 10 years. In traditional public schools, only 15% of teachers are in their first three years of teaching, and 43% have less than 10 years of experience and only 23 states require that charter schools hire licensed teachers (National Center for Education Statistics, 2011). As was the case with the school in this study, charter school contracts often call for a complex set of pedagogical practices, which may be difficult for even an experienced teacher to deliver. The lack of training and experience of charter school teachers also creates more teacher turnover in than in traditional schools, which is detrimental to school culture and student performance (Exstrom, 2012). This unique combination of teacher inexperience, lack of formal training in a certificate program, and complex pedagogical practices makes high quality professional development important for charter school teachers and the potential success of the school.

The data collected in this case study showed that despite multiple systemic barriers, it is possible for a charter school to offer a program of research based professional development when the school leaders hold a shared belief about its importance and create the conditions necessary for implementation. Interviews and document analysis confirmed that both the content and structure of professional development were aligned with best practice as defined by research. Hammer (2013) found that in order to impact student achievement, the content of teacher training should be aligned with school goals and focused on learning that deepens subject area knowledge and related

pedagogical approaches. Interviews with teachers, administrators and document analysis revealed that professional development had been primarily focused on supporting teachers as they learned the skills to implement the complex blend of pedagogical approaches required by the charter contract. Teacher training had also been focused on deepening subject area knowledge through a series of workshops delivered by certified trainers in Singapore Math and the Full Option Science System (FOSS).   All teachers and administrators interviewed stated that all professional development was rooted in the school mission and goals.

The structure for effective professional development should include an active learning environment that provides teachers an opportunity to plan for implementation, opportunities for teachers from the same grade level, department or school participate together, and should be of the appropriate duration considering the complexity of the skills being conveyed and includes follow up coaching or instruction (Hammer, 2013). Each of these elements of structure was present in the professional development program of this school, although to a slightly lesser extent than the elements of content. Teacher teams had the opportunity to work together during content area professional development, but not during training to learn or improve pedagogical skills. Workshops were repeated so that skills could be built over time, but there was no structured format to ensure that teachers received the follow up training necessary either from these repeated workshops or from coaching.

The professional development program at the school was highly personalized and teacher driven. Surveys were utilized to determine teacher interest in various topics and the resulting data were used to plan workshops held one time per week when students were released from school early. Teachers had the autonomy to choose which workshop to attend based on their own needs and preference and many of these sessions were delivered by teachers at the school.   Personalized teacher learning is not a part of the best practice framework used for this study, but it is very well supported by other research. Compton (2010) reported that teachers at later stages of their career need and desire different types of training than novice teachers and that teachers are motivated by having options for their ongoing development. Teachers at the case study school reported feelings of increased job satisfaction and feeling valued because they were able to deliver workshops and choose the direction of their own training.

The document and interview analysis also revealed that the professional development program had had an impact on teacher attitude, behavior and skill as well as the observed level of student engagement. The greatest impact was found in the area of teachers' ability to implement the skills and techniques that were covered in their training sessions. Teachers reported that their content area understanding in math and science had increased as a result of their training. Student engagement was reported to be increased by all of the administrators and five of the seven teachers interviewed. All interviewed agreed that it was too early to draw conclusions regarding the impact of professional development on student achievement, although results from the spring 2017 administration of the Measure of Academic Progress showed that students in all grade levels of the school performed better than national norm means. This is particularly notable for students in Kindergarten, who had no previous instruction at other schools. Of all Kindergartners assessed at the charter school, 76% scored better than the norm grade level mean in math and 80% scored better than the norm grade level mean in reading. Further study is necessary to make a connection between the program of professional development and student achievement.

Administrators who were responsible for planning professional development identified several barriers that are unique to the charter school environment. Financial constraints were the most often mentioned barrier due to the fact that the school was new, funded at a lower level than

traditional public schools, and had not yet had the opportunity to build financial reserves. This barrier was overcome by negotiating with textbook and supply vendors for training to be included with purchases, by utilizing the expertise of administrators and experienced staff to deliver professional development, and by allowing teachers to attend local workshops if they were willing to pay their own registration fees. The administrative team also applied for and received a sizable grant that they reported would allow for additional professional development in the near future.

Time was also identified as an obstacle. The charter contract requires a longer school day than a traditional public school, which severely limits the time available for professional development. This barrier was overcome by creating a schedule that included a student early release one time per week. This schedule was implemented when the school opened and did not have to be created after the fact. Finally, teacher dispositions or attitudes were also named as barriers. Teachers with previous experience in traditional public schools had demonstrated some resistance to the innovation required at the school. Administrators reported that they planned to continue to work to overcome this barrier by developing supportive working relationships with teachers, modeling their expectations, and coaching teachers through the evaluation process.

Conclusions

In this case study 10 interviews were conducted with 3 administrators and 7 teachers at one K-8th grade suburban charter school and professional development plans, professional development surveys and standardized assessment results were reviewed. Based on the evidence collected and analyzed, the research concluded that a program of research based professional development was implemented at the school of study. Furthermore, teacher training had impacted teachers' attitude, pedagogical skills and content delivery. Evidence also indicated that the teacher training impacted student engagement. Three major barriers to the delivery of high quality professional development were identified within this setting: (1) financial limitations, (2) lack of time for training, and (3) teacher attitude and disposition. As is true with any case study, this research was highly contextualized, and practitioners and researchers should avoid the generalization of these results to other settings (Greene, Caracelli, and Graham, 1989). It is quite possible that if this case study were replicated in a different context that there may be different results. In addition, one year of student assessment data is insufficient to determine the impact of teacher professional development on student achievement. Early success on standardized tests may be attributable to other causes.

Implications

While this case study was limited to one specific charter school, the results create implications for both practitioners and future research. The purpose of any school, whether it is a charter school or a traditional public school, is to cause students to learn at high levels and so ensuring the presence of highly skilled teachers should be considered essential rather than optional. Given the lack of experience and certification of many charter school teachers, it is important that charter school leaders not be tempted to offer a limited or low quality professional development program because of a lack of money, time, or teacher desire for training. This case study demonstrated that in this setting, a research based program that is most likely to impact student achievement while simultaneously meeting the needs of teachers at various stages of their career was present, despite the identified obstacles. This study also gives direction to practitioners who grapple with the

problems associated with teacher turn-over and a lack of teacher satisfaction regarding working conditions within charter schools. Teachers interviewed for this case study worked longer hours for less pay than their traditional public school counterparts and were required to implement a complex set of pedagogical practices. Despite these issues, the teachers reported feeling valued because their professional development program allowed them to share their talents and choose the training that was the best fit their needs.

The lack of studies investigating the impact of teacher professional development within charter schools also provides clear opportunity for future research. This case study can be replicated at schools with different conditions such as an urban or rural setting or within schools that are well established in order to determine if similar results are found when conditions differ. In this case study, high quality professional development was defined using the characteristics identified by the meta-analysis conducted by Hammer in 2013 for the West Virginia Department of Education; however, those characteristics do not include personalized learning for teachers. Further research should be conducted to examine the link between teacher job satisfaction in charter schools and teacher driven training in order to determine if the opportunity to guide one's own training reduces teacher dissatisfaction and turnover. Opportunity also exists to examine the impact of high quality professional development on not only student engagement, but student academic achievement using a variety of qualitative and quantitative research methods to examine different types of data in a variety of settings in order to create a causal link between the two and to understand if professional development is a defining characteristic of a successful charter school.

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