Reflections of High School Teachers on Implementing Professional Learning Communities and Project-Based Learning

Introduction

Texas A&M University’s Aggie STEM Center worked for three years with three high schools in an urban school district on the implementation of Project-Based Learning (PBL) and Professional Learning Communities (PLCs) in their science and mathematics classrooms. The main reason that these high schools, and many others, are interested in learning how to do PBLs is that the hands on, real world-oriented, group inquiry-based approach works better with diverse students than conventional teaching methods do (Capraro & Slough, 2008). The main reason that the district was interested in PLCs is that these provide time for teachers to plan, process, and grow together (McLaughlin & Talbert, 2001). However, to understand how the teachers in this district experienced this implementation of PBLs and PLCs, Aggie STEM Center researchers conducted a qualitative research project.

Qualitative research is generally used to gather the experiences or perspectives of one or more individuals (Lincoln & Guba, 1985; Marshall & Rossman, 2006). Accordingly, the spoken or written words of these individuals become the data for qualitative work (Creswell, 2009). The most common method for collecting such data is interviewing, either as a group or as individuals (Kvale & Brinkmann, 2009). In this study, the qualitative data were drawn from focus group interviews of teachers. As Patton (2002) concluded, “A focus group interview is an interview of a small group of people on a specific topic” (p. 385), though the size of the group, the length of the interview, and the degree of interview structure can vary.
In this specific case, the size of the groups ranged from four to ten teachers in three high schools within one district; the interviews lasted from 60-90 minutes. The participant groups were composed of either mathematics or science teachers at each of three high schools. The interview questions addressed the positive and negative experiences participants had with the sustained professional development (PD) on STEM Project Based Learning (PBL) and Professional Learning Communities (PLCs). The data were analyzed using categorization and thematization (Lincoln & Guba, 1985; Miles & Huberman, 1994; Patton, 2002).

Qualitative results

The main themes that emerged from the qualitative analyses were 1) teachers’ general experiences from using PBL in their classrooms, 2) teachers’ perceived changes in teaching methods drawn from using PBL in their classrooms, and 3) teachers’ general experiences with PLCs.

Teachers’ general experiences from using PBL in their classrooms

District-wide, the teachers indicated that there were major positive effects and some significant challenges from implementing PBL in their classrooms. The strongest positive effect they reported was that PBL increased student engagement. This result is particularly important, as one of the most frequently reported problems in diverse high schools is obtaining the engagement of diverse urban students. A second positive effect was that the PBL engaged those students who were typically unengaged. For example, one teacher said, “I find that more students are getting involved in the lab. Some of those that would just sit off to the side in a regular lab that are relying on the lab partners to do the work actually got involved in the project.” Similarly, another teacher in a different group stated that, “[The PBL] drew some interest from students who may not have been interested otherwise because you could say directly 'this relates to your project.' And then they would listen to the lesson a little more intently.” A third positive effect reported by teachers was that the use of PBLs increased the roles students could participate in by providing small group activities.

There were five more positive effects that were supported by two focus groups: real world PBLs made the learning more meaningful to students; PBL drew on a broader student skill set than did traditional teaching; students took more ownership for their learning; implementation of PBL moved the teachers toward more of a facilitative role; and, the PBL improved teacher’s relationships with the students. As can been seen, several of the positive effects related to student engagement, while other positive effects related to pedagogical improvements, but all of these were the kinds of positive changes typically sought in classrooms.

At the same time, the teachers also said that implementing PBL in their classrooms created some challenges. The greatest challenge the teachers related was that some students lacked sufficient prior knowledge or skills to complete the PBL. One teacher suggested,

“Our kids are, generally speaking…seventy to eighty percent of our kids are behind where they should be mathematically….so PBLs are interesting, but trying to make it fit with all the stuff that they don’t know…[for teaching this] makes it interesting.”

The second greatest challenge was that teachers felt there was not enough time to complete the PBL. Three focus groups agreed on two additional challenges: conflicts among students within their small groups (e.g., unequal work, personality conflicts) and the PBL approach to learning was a significant “paradigm” shift for the students. In the latter case, the teachers reported that students were so used to the traditional classroom that changing to a PBL-oriented classroom was difficult. As one teacher pointed out, these students had experienced the traditional approach from kindergarten to high school so getting
them to accept this substantially different approach was difficult.

Finally, there were three challenges supported by two focus groups: PBL was a pedagogical “paradigm” shift for teachers; teachers reported problems with pacing PBL well; and PBL does not fit some students’ learning styles. For instance, on the pacing issue, one teacher commented,

“One thing for me is…trying to know when I’m giving enough time versus too much time, whether the kids are just dragging their feet versus they’re really working with the material. It’s just very difficult for me to know when I need to say, “Okay this is a firm and hard deadline, and we’re going to stick to it,” versus “Okay. I can see everybody’s struggling, so I’ll give you guys one extra day or maybe, two extra days.”

Thus, the teachers reported some challenges on their part and some that were on the students’ side. However, it could be suggested that with more teacher and student experience in PBL, many of these challenges may fade.

Teachers’ perceived changes in teaching methods drawn from using PBL in their classrooms

The focus groups reported eight different ways that their teaching methods changed. Four focus groups said that doing PBL in their classrooms placed them, the teachers, in a more facilitative role and in less of a direct teaching or lecturing role. For example, one teacher in a focus group said, “When kids ask me questions [about the PBL] I ask them, ‘What does your team say? Go ask your teammates.’ And they are like, ‘oh, okay.’” Three focus groups agreed that they used more real world projects in their teaching. Three different focus groups also reported that using PBL in their classrooms promoted individual accountability and ownership.

There were two categories under this theme with which two focus groups agreed and three that only one focus group mentioned. One of these was that the PBL process helped the students see that they knew more than they thought they did. The other finding reported by two focus groups was that this method gave the students more freedom to learn from their mistakes. The three categories that were reported by only one focus group were that teachers have learned that students “doing it themselves learn better,” that teachers do less “drill and kill,” and that PBL provides an alternative teaching method for new teachers.

Teachers’ general experiences with PLCs

PLCs were an integral part of the PD the teachers received. The district supported the PLCs by providing an extra period every day for teachers to collaborate on improving teaching and learning. This collaborative period was in addition to the one period per day provided for individual planning. The strongest positive point mentioned by five of the focus groups was that the PLCs provided more time for the teachers to learn from each other. For example, one teacher said, “Improvement in teaching strategies has occurred because of the collaboration between new and old teachers.” Three focus groups mentioned two different categories: time to plan together and increased communication among teachers. Two focus groups suggested that PLCs made teachers feel less isolated and that PLCs supported new teachers. Individual focus groups reported that PLCs provided time to diagnose collectively student strengths and weaknesses; PLCs caused teachers to be more attached to the success of colleagues; the teachers have become better at teaming over time; and, PLCs caused there to be more sharing of supplies and equipment.

On the negative side, two categories were provided by three focus groups. The first category reported was that PLC meetings were sometimes interrupted by school leaders and second, that some PLC time was not spent on teaching and learning. Three categories were repeated by two focus groups: teachers wanted more PLC time; subject-focused PLCs, i.e., mathematics teachers in a PLC with other mathematics teachers, did not provide time for interdisciplinary PLC; and, the goal of consensus was sometimes difficult and more time consuming than individual planning. Finally, two categories were mentioned by only one focus group: some teams had teachers who were persistently in conflict with each other and that teachers in a team sometimes struggled to come to consensus.
Conclusion

The teachers’ responses regarding their general experiences with PBL implementation closely aligned with the goals of this pedagogical approach and past research. For example, in relation to engagement, teachers reported overall enhanced student engagement and more engagement of the typically unengaged students. Enhanced student engagement was attributed to the real world focus of the PBL. Teachers also reported a broader range of student skills due to the small group work, and improved relationships with students. On the challenge side, pacing and time constraints were difficult for some teachers; small student group work led to some student conflicts; and problems with the prior knowledge of the students. Further, teachers saw the use of PBL in their classroom as a “paradigm shift” for them and for students, which led to some struggles for both. As to changes in their teaching practices, the teachers reported their role as more facilitative and less directive, greater real-world focus, promotion of individual student accountability and ownership, providing more freedom for students to learn from their mistakes, and doing less “drill and kill.”

The teachers generally had positive conclusions about the implementation of PLCs. They were mainly enthusiastic about the daily time to plan and learn together, to increase the communication among themselves to provide more support for new teachers, and to experience less isolation. On the other hand, the teachers raised issues of personality conflicts, difficulties in coming to consensus, time being wasted by interruptions of administration and by not using PLC time for teaching and learning issues, and a lack of time to do interdisciplinary work. Nonetheless, the positives were much stronger than the challenges.

Consequently, simultaneously implementing PBL in their classrooms and PLCs was a fairly radical change for the teachers. It introduced a significantly different pedagogy to them and created much more opportunity for them to develop a professional community among themselves. Not surprisingly, the teachers valued some of this change and did not like some of it. Thus, to a significant degree, this change was a struggle for them, but they also found many aspects of both PBL and PLC to enhance their classrooms and improve the learning of their students.

References


Aggie Science, Technology, Engineering, & Mathematics (STEM) Center

The Aggie STEM Center is a partnership among Texas A&M University, the College of Education and Human Development and the Dwight Look College of Engineering. The Center has expanded to reach numerous T-STEM academies and independent school districts across the state of Texas. The center supports, creates and provides research-based professional development and other services for high quality, secondary-level STEM teaching and learning.

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