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Professional learning with action research in innovative middle schools

Steven Netcoh, Mark W. Olofson, John M. Downes, & Penny A. Bishop

Abstract: This article illustrates how action research can be used as a model for professional development with middle grades educators in rapidly changing and technology-intensive schools. Drawing upon ten years of using this model, the authors present three examples of educator action research to highlight five characteristics of effective projects: (1) appropriate scope, (2) a collaborative approach, (3) accountability, (4) various data sources, and (5) a clear link to practice. Action research with these characteristics can help middle grades educators address emergent problems in 21st-century classrooms and respond to the evolving needs of young adolescents.

Keywords: *action research, professional development, middle grades, technology, 21st-century schools*

This We Believe characteristics:

- Students and teachers are engaged in active, purposeful learning
- Educators value young adolescents and are prepared to teach them

As far back as 1920, middle school proponents have asserted that young adolescents deserve teachers who understand their developmental needs (Briggs, 1920; Koos, 1920). Nearly one hundred years later, 21st-century technologies present teachers with a whole new set of tools with which to meet these needs. Middle schoolers' desire for affiliation, for example, can now be addressed through the skillful integration of social networking and online collaboration tools. Their need for competence is fed by immediate access to information provided across the Internet. In pursuit of mastery, they can consult YouTube

videos for inspiring examples and detailed instruction on just about any hobby or skill. Direct interactions with a worldwide audience, new online social dynamics, and access to expensive hardware fuel their quest for autonomy and responsibility.

Yet the rapid evolution of technology in the lives of young adolescents introduces novel questions into contemporary classrooms. In particular, educators often struggle with the emerging disconnect between students' out-of-school and in-school technology lives (Buckingham, 2007), particularly during the middle grades years when technology use increases dramatically (Hofferth & Moon, 2012; Parent, Sanders, & Forehand, 2016; Rideout, Foehr, & Roberts, 2010). Today, 92% of teens ages 13–17 report accessing the Internet on a daily basis, with 89% of 13- to 14-year-olds using a mobile device to do so (Lenhart, 2015). Many experienced teachers must adopt completely new management and instructional strategies when they incorporate technology into their practice, particularly as they transition to 1:1 computing in which each student has an Internet-accessible device. New teachers trained in analog environments face still greater challenges.

As a result, teachers of young adolescents often find themselves needing to develop and continually refine responsive strategies while teaching. The nature of this work, essentially building the plane while flying it, calls for an interactive and iterative approach to professional development. As middle grades teacher educators, we have used action research for more than a decade as a dynamic and engaging teacher learning model to help educators transition from low-tech to high-tech classrooms. When teachers are guided to identify relevant questions, design and take action, collect and analyze data, reflect, and redefine their challenges (Herr & Anderson, 2005; Kemmis & McTaggart, 2005; Lewin,

1946), they are positioned to create and critically evaluate their own solutions to contemporary challenges.

The purpose of this article is to highlight the use of action research as an effective means of middle grades teacher professional development in the 21st century. Acknowledging that teacher action research often is undertaken as graduate work, this article is intended to support planning conversations between teachers and professors, identifying key facets of successful project design to maximize opportunities for professional growth. We begin by briefly describing the context of our work with over 25 schools and over 300 educators. We then present three examples of action research projects conducted by middle grades educators showcasing contemporary challenges in technology-rich settings. Next, we analyze these examples and describe five characteristics we have found to be crucial for success in this model of professional development.

Context

Our work with the teachers described in this article took place during multi-year partnerships between our university-based professional development program and the teachers' respective middle schools. The program provides intensive professional development to in-service middle school educators as they create developmentally responsive, technology-rich learning opportunities. To partner with us, schools must possess several attributes of effective middle schools, including interdisciplinary teaching teams of two to four teachers and daily common planning time. Each school establishes a teacher-dominated leadership team whose task is to set goals for the partnership and guide our facilitation of 60–80 hours of highly customized professional learning each school year. Although not required for a partnership, all schools discussed in this study provided each teacher and student a laptop, Chromebook, or tablet computer with which they could access the Internet, software programs, and apps.

Action research for middle grades teacher learning

The professional development for these partnerships derives from a coherent plan for school improvement. In alignment with effective professional development practices (Ball & Cohen, 1999; Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; Desimone & Garet, 2015), it focuses on what students are expected to

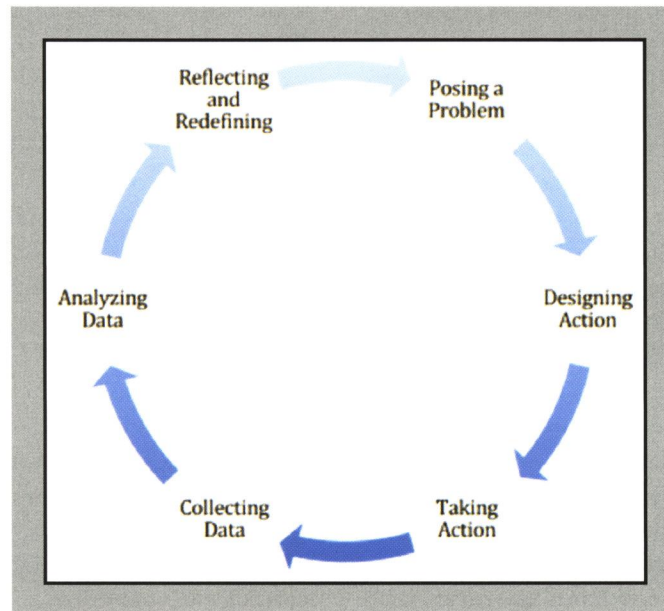
learn and do; it is ongoing and sustained; and teachers pursue it collectively and actively, with opportunities to experiment, observe, receive feedback, and analyze student and teacher work. In keeping with these professional development tenets, action research lends important structure to teachers' collaborative inquiries.

The action research cycle (see Figure 1) helps teachers learn "in and around their practice" (Ball & Cohen, 1999, p. 4) as they pose inquiry questions that emerge from their work with students (Darling-Hammond, 2008). Action research is relevant to the lived experiences of teachers, and their learning is immediately applicable in their own classrooms and schools (Mills, 2011). As teachers conduct action research, they influence their contexts through their work and reporting out to invested stakeholders, enabling action research to be a conduit for actionable changes (Stringer, 2014). Action research also offers a format with clear entry points for students to be involved in the process of classroom and school change (Schensul & Berg, 2004; Tsafos, 2009), which is particularly important as schools grapple with their transformation toward technology-rich teaching and learning (Downes & Bishop, 2012).

Action research has a rich history of supporting the development of a professional disposition of teachers as continuous learners and change agents (Mills, 2011). In the middle grades, in particular, participation in action research has stimulated a shift in teachers' core beliefs, such as in the teaching and learning of mathematics (Sakshaug, Wohlhuter, & Lach, 2008), statistics (de Oliveira Souza, Lopes, & Pfannkuch, 2015), and science (Mitchener & Jackson, 2012). Similarly, middle grades teachers have leveraged action research for educational change initiatives, such as implementing an inclusion model (Stanton, 2005), enhancing student motivation (Sanguras, 2005), and building a culture of empathy (Bradshaw, 2016).

The following descriptions of three action research projects convey how middle grades educators working in technology-rich schools used action research for their professional growth. The teachers conducted these projects as part of their graduate credit-bearing professional development work with our institution. We collected information about these projects through a series of interviews with teachers and students, which were conducted to better understand their action research projects and student involvement. We used a semi-structured interview approach to allow participants' perspectives and

Figure 1 Action research cycle. This figure illustrates the cycle of action research that guided teachers' inquiry. © Educational Action Research. Reproduced by permission of Taylor & Francis. Permission to reuse must be obtained from the rightsholder.



understandings to emerge while still gathering information that could be compared across cases (Merriam, 2009). The following descriptions are intended to serve as illustrative experiences of middle grades educators using action research for professional learning.

Action research project 1: iPads and individualized learning

Deb, a special education teacher at Mountainside Middle School (MMS) who worked with students in mainstreamed classrooms, wondered if technology might be a tool to increase differentiated support for her students. For her action research project, Deb decided to investigate how students and teachers could use technology to individualize learning more efficiently for students with special needs. Deb anticipated that she could better meet her students' needs if some individuals were engaged with independent learning tasks while she worked with others in small groups. Knowing that her students were deeply interested in using the iPads that were recently introduced into the school, Deb identified these devices as having potential for engaging students.

To promote individualization and ownership of their learning, Deb invited students to explore and identify apps they felt would help them learn. They also collaboratively developed expectations and parameters for their work with the iPads. Deb explained to students that most apps would cost money and quickly noticed that the cost implications "made them be conscientious" in their search for apps, prompting students to realize that "my suggestion's got to be good." By having an opportunity to research and propose programs to support their learning, students took increased ownership of the learning process and were able to identify apps that were responsive to their individual needs. Deb allowed students to use these apps in class while she circulated the classroom to work individually and in small groups with their peers.

To assess the effectiveness of this new approach to individualizing instruction, Deb drew on a few different sources of data. At the end of class, she frequently asked students to use their iPads to report the activities and tests they were able to complete during that class period. She also asked students to assess their own level of engagement: "I would ask them what tasks did they get completed, did they feel like they were engaged 100 percent of

the time, 75 percent of the time, like just really quick.... That was their exit card sort of thing.” Deb used this data to better understand the extent to which her new approach to individualization using technology was meeting students’ needs and engaging them with their learning. She also used data provided by an iPad reading app to see how much students were reading independently during class time. Deb had her students use this data to graph their reading performance over time so they could see and track their own progress.

Using this data along with her personal observations of classroom activities, which were occasionally documented through journaling, Deb felt that the use of iPads enabled her to more efficiently individualize instruction for her students. In reflecting on her action research project, Deb asserted that the learning activities on the iPad were more engaging for students than the traditional reading and writing assignments she had previously asked students to complete while she worked one-to-one with their peers. She observed that the iPad provided “easy engagement and they loved it, so I didn’t have to do the classroom management piece with those kids.” Deb found there was an “immediate coolness factor” with iPads that helped her students engage with their learning using this technology. Through her action research project, Deb grew her capacity to use multiple teaching approaches to support her students’ needs and learning (National Middle School Association [NMSA], 2010). Moving forward, Deb hoped to further expand her professional growth within this area of inquiry by “figuring out how to support kids with using technology to really keep track of their learning plan.” Through action research, Deb felt empowered to find ways to help her students take more responsibility for their own learning.

Action research project 2: Personal device use

Kim, the principal of MMS, knew there was increased interest among teachers in using technology to support student learning, but she also understood that teachers were concerned by students increasingly using personal devices, such as smartphones, tablets, and handheld game consoles, in violation of school policy. To address this emergent issue, Kim collaborated with her student leadership class to conduct an action research project aimed at creating school-wide norms for technology use. As the principal of the school and facilitator of the leadership

class, Kim was well positioned to engage with the school-wide scope of this project.

To begin the action research cycle, Kim and her students analyzed recent data on student violations of the school’s technology policy. The data, compiled by the school counselor from all disciplinary referrals and behavior infractions at the school for use in Kim’s leadership class, illustrated rapidly increasing technology violations and confirmed that device use was an issue in the school. They then brainstormed potential uses of technology, such as for entertainment, social communication, and learning assistance. Kim worked with students in her leadership class and staff to define “zones” within the school where these different uses of technology would be appropriate. Devices were not allowed in “red zones,” such as hallways, bathrooms, and locker rooms, because the expectation was that students would engage in face-to-face interaction in these areas of the school. In “orange zones,” which consisted primarily of classrooms, students could use technology only for learning purposes. The cafeteria was a “green zone,” wherein students could use technology for the widest of purposes, including entertainment and socializing. For each zone, Kim and her students developed consequences for device violations. These new zoning policies were communicated to students, teachers, and staff and were piloted over the course of 6 weeks.

To assess the impact of their actions, Kim and her student leadership class revisited the data on school-wide technology infractions at the end of the 6-week trial period. According to Kim, “The misuse of technology almost fell off the chart as if [it was] not even an issue any more.” Additional data, in the form of student and teacher observations in the cafeteria and hallways, supported this finding. Before changing the school’s handbook to reflect these new zoning policies, Kim and her student team surveyed the school staff to gather their impressions of technology use in the school and to ascertain whether or not they were ready to move forward with the policy. Overwhelmingly, the staff reported that device use no longer presented a problem at MMS and supported moving forward with the zoning plan. By collecting multiple forms of data, Kim and her student leadership team were able to assess the extent to which their action research project met its intended goals.

Through action research, the principal of MMS was able to address an emergent 21st-century problem, misuse

of technology in school, in a way that was responsive to the needs of young adolescents. Rather than interpreting the increasing violations of school technology policy as a signal to ban devices from the building, Kim felt empowered through action research to test a solution that involved students and teachers in the decision-making process (NMSA, 2010). This in turn contributed to a school environment that was more reflective of students' contexts outside of school. In particular, these changes minimized disruptions caused by technology in the hallways and cafeteria. By developing a solution that integrated technology into the school community, the action research project encouraged teachers to use devices to expand their approaches for engaging students with their learning. For instance, students used cell phones to quickly access the Internet and answer questions raised in classroom conversations. They also began using their cell phone cameras to capture images of their work and notes on the whiteboard.

Action research project 3: A student leadership council

Students on a small alternative team at River Bend Middle School (RBMS) were not engaged with their learning; at least that is how the team's two teachers, James and Carol, interpreted their rebellion against classroom rules and their questioning the purpose of studying math. This perceived disengagement became the basis for the teachers' action research project, through which they developed a student leadership council to share decision-making about curriculum, instruction, and team activities with students. James and Carol wanted to know if giving students more voice on matters related to curriculum, teaching, and the classroom environment through the leadership council would contribute to greater engagement in school and in their learning. They viewed the student leadership council action research project as directly related to their practice and an opportunity to systematically assess the effectiveness of their response to student disengagement in the classroom.

Starting in late October, James and Carol met with the student leadership council one day a week to discuss issues related to curriculum, instruction, and classroom policies that students raised to the teachers. Notes from these meetings were recorded to a shared online platform, which allowed the teachers to track the trajectory of their conversations with students. After a few weeks of action,

James and Carol reviewed these notes and recognized that rather than using council meetings to address the teacher-defined problem of low engagement, students wanted to discuss more tangible issues, such as accessing their school-issued laptops and personal devices during class time. Accustomed to using technology outside of school, students asserted they would be more able to focus in class if they could use their laptops at their desks in appropriate situations, listen to music while doing independent work, and have access to their cell phones throughout the day. As one student put it, "It's the 21st century!" The problem, however, was that the classroom did not match their 21st-century contexts outside of school. For these students, there was a clear disconnect between their learning environments inside and beyond school walls, which they felt contributed to their disengagement in the classroom.

Once this problem was identified through analysis of their personal observations and the document data, James and Carol reshaped the scope of the action research project and the student leadership council to focus on creating a learning environment that more closely aligned with students' technology-rich contexts outside of school. Students and teachers collaborated to negotiate technology use in the classroom. Teachers agreed to allow students to listen to music from their devices during independent work time. To assess the impact of this new policy, James and Carol reflected on their day-to-day classroom observations, along with minutes from their leadership council meetings, which suggested allowing students to listen to music during independent work time did not present new distractions and actually helped some students focus on their learning tasks. Based on this success, students and teachers continued their leadership council conversations about the parameters of device use in class. Teachers and students ultimately agreed to a trial period during which students could use their devices in class.

By reflecting on their observations as a part of the action research process, James and Carol began to see the legitimate uses for devices in the classroom. As James reflected, "I would see that there were kids that were using it in a fashion that was acceptable and promoted their learning." These teachers came to understand that students could be focused while listening to music during independent work time and could use their devices to supplement lessons and activities by looking up unknown words or conducting quick background research on new topics. The teachers also assessed the outcomes of their

project by collecting survey data on student engagement prior to and after implementing the student leadership council. Referring to this survey data, Carol asserted, "We had pretty good results." She also acknowledged, however, that the data revealed room for growth in the area of "student say about the curriculum," which made sense to her given the leadership council's increased focus on issues related to the learning environment.

In this case, action research was a stimulus, surfacing some of the issues underlying students' lack of engagement with their learning, primarily the disconnect between their in-school and out-of-school contexts. Before students could begin contributing to conversations about what and how they should learn, they needed their learning environment to reflect the technology-rich context of their lives outside school walls. Although teachers did at times encounter issues with device use during the project, such as using devices at inappropriate times, their classroom began to look and feel more like students' 21st-century contexts outside of school. The action research project allowed teachers to respond effectively to an emergent problem by developing a shared vision for their learning environment with students (NMSA, 2010). During this process, students came to see that teachers valued their perspectives and were willing to adopt new classroom policies based on their feedback (NMSA, 2010). As one student explained about the student leadership council, "Like [the teachers] actually listen to you.... When you put up conversation, they listen to you." Action research facilitated a context-specific solution to an emergent 21st-century problem in a way that was responsive to the needs of young adolescents.

Elements of successful action research

In this section, we use our experiences at MMS and RBMS to distill the critical components of action research that now guide our middle grades professional development work in other schools: (1) appropriate scope, (2) clear link to practice, (3) collaborative approach, (4) accountability, and (5) various data sources.

Appropriate scope

The first characteristic of many successful action research projects is that they are narrow in scope and address problems and populations that are well within the

researchers' locus of control (Mills, 2011). In the case of RBMS, the team's initial problem was nebulous, as student engagement is a broad concept and difficult to measure. The teachers did, however, keep the scope of their project narrow by focusing on student engagement solely within their team. As the action research progressed, the scope of the work became even more focused as the student leadership council defined problems with the team's technology policy. At MMS, Kim's action research project was broader in scope, as it focused on school-wide change. Such a scope was appropriate, however, given Kim's role as principal and her responsibility for school-wide change initiatives. The project scope was also appropriate in that it focused specifically on the use of personal devices in school. It sought to establish norms around personal device use in response to concerns raised by teachers and students. Finally, Deb at MMS kept her action research project focused on her own students and on a well-defined and narrow solution, namely, using iPad apps to support more individualized instruction. In each of these cases, the scope of the work was aligned with the educators' areas of influence.

Clear link to practice

One of the strengths of action research with in-service teachers is that the professional development work is embedded directly within teachers' practice (Mills, 2011). Rather than asking teachers to engage with theoretical or disconnected coursework, participants identify problems and develop solutions that are directly and immediately relevant to their personal practice. As an administrator, Kim faced the day-to-day issue of technology policy infractions. She learned that students in her leadership class wanted a policy that embraced the use of personal devices in spite of considerable reluctance on the part of her teachers. Action research served her interest in cultivating thoughtful and analytical student leaders while simultaneously addressing a critical controversy in the school community.

For Deb, individually supporting her students was central to her role as a special educator. She eventually saw action research as an extension of "what we naturally do as teachers, try this, and ask, did it work?" She embraced its potential for collegial work as well, adding:

Some days I'll go to another colleague and say that was the worst lesson ever and never do that again. That's how we operate from day to day. I think

framing it in a way, here's my question and just cycling through over and over is really good.

Working with students to identify useful technology tools to support their needs was a clear "next step" in her practice with the introduction of iPads into the classroom.

The RBMS team initially identified a broad issue that, although connected to their practice, addressed the larger question of student engagement. As they worked with students to pare down the scope of the project to technology use in the classroom, their action research became more highly aligned with their daily practice as well as the concerns of their students. They were able to test new ways of supporting students in their learning and actively reflect on the efficacy of these approaches within the context of their day-to-day practice. This natural relationship between action research and a teacher's practice is one of the strengths of this approach to professional development.

Collaborative approach

Collective participation is vital to the success of a program of professional development (Desimone, 2009; Desimone & Garet, 2015). Successful action research is grounded in collaboration and consensus building among stakeholders (Stringer, 2014). In our cases, having partners in action research was vital in sustaining educators' projects. Deb from MMS understood collaboration with students on her action research project as an invaluable professional learning opportunity. She explained, "The fact that the learning is going back and forth between me and kids is huge." Collaboration is also important in action research because it engages students in the process, which enables researchers to develop more effective solutions (Downes, Bishop, Swallow, Olofson, & Hennessey, 2016). At RBMS, for example, it was not until teachers engaged students in the action research process that they began to identify a condition underlying student disengagement (i.e., the mismatch between in-school and out-of-school technology use) and develop a collective solution that was responsive to students' needs. Similarly, Kim's action research collaborations at MMS enabled her to draw on students and teachers' unique knowledge of device use within the school to develop an effective solution to the problem of increasing technology policy violations. Kim also believed having a partner in the process was essential to sustaining her action research. She noted, "So it's almost like I need somebody that is really just there for me for the process to help me keep going." In all of these cases, collaboration contributed to more effective action research.

Accountability

Effective professional development requires teachers to actively and continuously engage in the work (Desimone & Garet, 2015). Action research projects sometimes can be lost in the flood of responsibilities that emerge in educators' day-to-day work in schools. We found that educators engaging in action research appreciate some form of accountability to keep their projects on track. As one of the teachers at RBMS explained, "This kind of accountable talk we have as educators is what I think, for me, moves my work forward." This accountability might come from external professional development providers, school leaders, colleagues, or even students. Another teacher made this point while discussing a potential system for reporting progress on action research projects. When asked about to whom he would want to report out, he said, "To your cohort of teachers from partner schools. To the professional development coordinators. To whomever. It doesn't really matter who but just having that space out there." Similarly, after acknowledging that educators' "great intentions" with action research can get lost once the school year starts and "life gets really crazy," one of the MMS teachers asserted,

And like with [your organization], if the professional development coordinators know that you've set this goal, they are checking in and they're going to be showing up.... It helps you be accountable and make sure that you're successful and follow through.

As these comments suggest, a form of accountability is important to the success of some educators' action research projects.

"Action research projects sometimes can be lost in the flood of responsibilities that emerge in educators' day-to-day work in schools. We found that educators engaging in action research appreciate some form of accountability to keep their projects on track."

Various data sources

According to Stringer (2014), action researchers "need to be parsimonious in selecting information specifically pertinent to the issue, as a mass of peripherally relevant information may create less rather than greater clarity" (p. 104). The action research projects at MMS and RBMS demonstrate,

however, that a broader interpretation of data can deepen teachers' action research. Kim at MMS used the most diverse sources of data to inform her action research project. She and her students examined school data on technology policy violations, surveys of teachers and students, and observations by students and staff to define the problem and drew on these same sources to assess the effectiveness of their proposed personal device policy. These varied data sources provided Kim and her student researchers a more comprehensive picture of the problem and allowed them to track the efficacy of the solution over time. The teachers at RBMS primarily relied on observations and documentation of conversations with students to define the problem of low student engagement and to assess the solutions developed through their action research project. They also collected survey data before and after launching the student leadership council to assess changes in student engagement. The collection of both quantitative and qualitative data gave teachers on the RBMS team different ways to understand the problem and the efficacy of their solution. Part of Deb's work with her special education students at MMS involved tracking independent and supported work time. Students provided information about the tasks they were able to complete in a class period, informing the action research project as well as Deb's daily practice. She also gained additional insight into student progress in reading by reviewing the analytics generated by the apps her students used. Each of these cases illustrates the benefits of action research projects that draw from multiple and varied sources of data and the ready availability of data in technology-rich classrooms.

Conclusion

Widely available technologies are transforming the way young adolescents grow up. Students' widespread use of mobile and personal devices yields new manifestations of their social-emotional, physical, moral, and intellectual needs. For instance, students from MMS and RBMS needed school policies that honored how much they valued independent access to devices throughout the day. MMS's principal and RBMS's teachers knew they were in uncharted territory, needing novel and rapid solutions to address their students' emerging needs. Innovative schools like RBMS and MMS depend on teachers who collaboratively identify problems and iteratively pursue solutions. Deb, Kim, James, and Carol used action research as a structured yet exploratory way to design and refine responsive middle school practices, such as MMS's revamped personal device policy and RBMS's

student leadership council. Issues of access and appropriate use of technology are real and immediate for teachers and students alike, and professional development using an action research model can provide a structure to address these rapidly emerging problems.

“As young adolescents continue to express their needs in new and diverse ways in the 21st century, professional development based in action research can help teachers and students address emergent challenges and opportunities together.”

As facilitators of professional development in these and many other cases across our school partnerships, we believe teachers benefit most when action research projects possess a number of key characteristics. Teachers appreciate bounded, manageable projects with appropriately narrow research questions. They are more likely to stay on track with their projects when they are accountable to an outside facilitator or collaborate with peers, administrators, and their students. The research is most productive when teachers identify, collect, and analyze multiple types of data. Finally, the participant-generated focus of action research thoroughly integrates intensive professional development into a teacher's daily practice. Action research projects with these characteristics reflect principles of effective professional development and support middle grades teachers' immediate efforts to meet emerging needs of young adolescents in their classrooms.

The action research cycle also provided educators from RBMS and MMS a framework to involve their students in the process of school change. The projects helped students, teachers, and principals develop a shared vision and collaborate in decision-making. Students at RBMS shaped the project's problem statement, Deb's students selected and experimented with apps, and Kim's students analyzed behavior data and drafted school policy. The action research in each of these cases prompted professional learning and practical, timely solutions that were responsive to the unique needs of their students, aligning with DiLucchio, Leaman, Elicker, and Mathisen's (2014) observation that “teacher research gives teachers a tool to further understand the young adolescents with whom they work” (p. 11). As young adolescents continue to express their needs in new and diverse ways in the 21st century, professional development based in action research can help teachers and students address emergent challenges and opportunities together.

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