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Connie DiLucchio
West Chester University of Pennsylvania, cdilucchio@wcupa.edu

Heather Leaman
West Chester University of Pennsylvania, hleaman@wcupa.edu

Kathleen Elicker
West Chester University of Pennsylvania

Denise Mathisen
West Chester University of Pennsylvania

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West Chester University of Pennsylvania

Teacher research (practitioner inquiry) is an effective form of professional development for middle level teachers. Through teacher research, classroom teachers develop the skills needed to demonstrate mastery of the performance standards for middle level master teacher candidates. Using well-established research methods, middle level educators conduct classroom inquiry projects to investigate their teaching and their students' experiences and learning. This article explains the work of 4th to 9th grade teacher researchers who investigated: (a) new teaching methods or curriculum, (b) approaches to teaching that allow for teachers to meet the needs of all learners, (c) transitions for young adolescents or teachers, and (d) experiences that support young adolescents' thinking and development. In order to describe the teacher research model, two middle level educators share their experiences of conducting research in their 5th grade classrooms. Throughout the article, the authors draw connections between middle level teachers' research experiences, student and teacher learning.

Teacher research is an effective vehicle for teachers to examine their own practice through authentic investigations of their teaching and their middle school students' learning and experiences in school. It allows teachers to develop deeper understanding of the young adolescents they teach while developing the skills needed to demonstrate mastery of the performance standards for middle level master teacher candidates. According to the Association for Middle Level Education (formerly National Middle School Association) Masters Level Teacher Preparation Standards (2005), middle level teachers should engage in: (a) the use of research based and data based decision making; (b) professional development for themselves and colleagues through research; (c) professional literature and resource development; (d) life-long learning; and (e) refining classroom and school practices that address the needs of all young adolescents based on research, successful practice, and experience (*Standard 7 Middle Level Professional Roles*). Teacher research incorporates each of these practices as teachers engage in their own professional development alone or with colleagues. As researchers, teachers use well-established methodology to conduct classroom research that benefits all middle level learners.

Teacher research motivates teachers to use their classrooms as sites for inquiry to better understand and improve on one's practice and/or the contexts in which they work (Hendricks, 2009; Hubbard & Power, 2003; Klehr, 2012; Somekh & Zeichner, 2009). In these contexts, teacher researchers choose research questions that matter to them and emerge from their work with students and use their "insider" knowledge to change classroom practice (Manfra, 2009). According to Falk and Blumenreich

(2005), research about practice is "learning about something that you really care about: about finding out the "how," "what," or "why" of something" (p. 21).

The purpose of teacher research, to enrich practice and produce knowledge about teaching and learning, is carried out in middle level classrooms with the intention of supporting young adolescent learners. This article will review the work of middle level teachers who conducted teacher research projects in their classrooms as part of the M.Ed. in Applied Studies in Teaching and Learning program. The terms teacher research and action research are used interchangeably in this article. Broadly speaking, both terms refer to intentional, systematic inquiry to improve the quality of teaching and student learning.

The Teacher Research Model

The M.Ed. in Applied Studies in Teaching and Learning program gives experienced educators opportunities to advance the knowledge and skills needed to be practitioner-leaders within their profession. This program recognizes the value of experience; applicants must have teacher certification (elementary, secondary, art, music, special education, etc.) and a year of successful full-time teaching. The program culminates in a teacher research project completed as part of the course, *Teachers as Classroom Researchers*. Teachers working with young adolescents in grades 4-9 select research questions or topics that reflect the goals of middle level education and are inherently aligned with the AMLE principles. After selecting a question or topic that originates from their work with young adolescents, teachers follow the well-established action research methodology by:

- Reviewing the related literature through identifying, reading, and reviewing related recent studies, articles, books and dialogue in fields related to the research question or topic;
- Developing a research plan to investigate a new intervention or examine a current intervention. This includes determining the study participants (whole class, sub-group or individual), selecting appropriate qualitative and quantitative data to collect;
- Implementing the study during a 6-8 week period, collecting data, reviewing those data and making changes to the data collection plans as interim analyses allow the researcher to evaluate her/his research, unfolding results and adapting the study or data collection in response to the interim evaluation;
- Completing a full analysis of data collected, representing themes and quantitative data results graphically;
- Drawing conclusions and suggesting implications for future teaching and learning as related to teachers' learning from their study;
- Engaging in ongoing reflection on teaching and learning as a part of the teacher research process; and
- Sharing one's work in class, with colleagues and administrators in their school districts.

Through this process, teachers take charge of their own professional development, demonstrating the professional dispositions expected of middle level teachers who see themselves as lifelong learners.

Middle Level Teacher Research 2007-2012

In order to investigate the types of classroom research conducted by middle level teachers, a content analysis of studies completed by teacher researchers in the M.Ed. in Applied Studies in Teaching and Learning program was conducted. Fifty-one projects completed by teachers of students in grades 4-9 during 2007-2012 were reviewed and grouped into themes and like topics. Grades 4-9 were selected to reflect the grade level ranges for middle level certification or endorsement across the United States. The purpose of teacher research and the model used to investigate one's practice are reflective of Essential Attributes and Characteristics (Association for Middle Level Education [AMLE], 2010, p. 13) and are focused on developmentally responsive teaching and learning and equitable learning in middle level environments. In the analysis and synthesis of teachers' research projects, it was clear that *all* projects focused on young adolescents' needs and equity in learning environments.

In review of the 51 teacher research projects, there were several prominent common themes. Within each teacher research project, multiple themes can be identified and each of the action research examples can be linked to the AMLE principles. For the purpose of this article, however, teacher research examples have been grouped according to the following overarching themes:

- Investigating teaching and learning models and new programs implemented in classrooms, schools or districts (Models and Programs);
- Meeting the needs of all learners (All Learners);
- Transitioning for young adolescents and teachers (Transitions); and
- Supporting young adolescents' thinking and development (Young Adolescent Learning).

These themes capture the research topics or questions and the intentions of the teacher research projects completed by thirty-one of the fifty-one teachers whose studies were reviewed for this article (see examples of research topics in Table 1). Simultaneous-

Table 1. Examples of Research

Teacher Research Investigating New Models or Programs
Implementing a Balanced Math Curriculum in Grade 4
Using a Building Wide Positive Behavior Plan to Improve Student Behavior in the Middle Grades
Effective Grouping Methods in a 5th Grade Classroom
Implementing Multiple Reading Comprehension Strategies in 6th Grade Language Arts
Using Response to Intervention for 6th Grade Students in a Learning Support Classroom
Introducing Simple Solutions, A Basic Math Skills Maintenance Program in Grades 7 and 8
Teacher Research Investigating Meeting the Needs of All Learners
Student Learning Contracts for 5th Grade Students with Gifted IEPs
Examining Discourse Patterns with Academically At-Risk 5th Grade Students
Impact on Student Learning: Incorporating the Interactive White Board in 7th Grade Mathematics
Using Exit Tickets as Daily Assessment in Grades 7 and 8
Meeting the Needs of Non-Proficient Readers in 9th Grade Language Arts
Supporting a Student with Asperger's in Grade 9 Social Studies Class
Teacher Research Investigating Student or Teacher Transitions
Healthy and Successful Transitions from Elementary to Middle School
Coaching: Supporting New Middle and High School Teachers Through Their First 3 Years of Teaching
Preparing the Middle School Student for Proficiency in High School Technology
Teacher Research Investigating Young Adolescent Thinking & Development
Environmental Awareness and Action: 4th Grade Students' Recycling Behaviors and Attitudes
Integrating the Arts in 6th Grade Content Areas: Student Perspectives and Development
The Impact of Implementing Web-Based Problem Solving Tasks in 6th Grade Math

Note: Titles adapted

ly, the teachers' classroom research studies provide evidence of the Essential Attributes and Characteristics of *This We Believe,* in practice.

New teaching models and programs. The implementation of new curriculums or programs was the topic of a number of teachers' research. Teachers were interested in investigating teaching and learning models or programs that were newly introduced in their classrooms or schools with the intention to draw data driven conclusions about these new programs and their effectiveness for young adolescent learners. In some classrooms, teachers were investigating school-wide programs that were newly implemented to reflect regional or national trends, such as: Response to Intervention (RtI), Responsive Classroom, Differentiated Instruction, and school-wide behavior programs. In other instances, teachers investigated a locally implemented curriculum, teaching or learning model. In each example, teachers systematically investigated a model, curriculum, or program in order to determine its effectiveness for their students in grades 4-9 and to make informed decisions about its use in their classroom. These projects reflect the AMLE characteristic, A Challenging Curriculum, (AMLE 2010, p. 17) suggesting that middle level learners should be exposed to rich, challenging, relevant curriculum.

Meeting the needs of all learners. Teachers in the M.Ed. Program are encouraged throughout the teacher research process to keep students at the center of their work. This focus is reflected in examples of middle level teacher research where various teaching and learning approaches were used or investigated to understand their effectiveness in meeting the needs of all learners. Teacher researchers investigated not only the impact of particular curricula or teaching methods on special populations (young adolescents identified as gifted and talented learners, young adolescents identified with Asperger's syndrome, young adolescents receiving learning support), but also the different ways students learn. For instance, teachers investigated the use of learning contracts, technology and assessment techniques on sub-groups or particular populations, and examined ways in which students' learning styles influenced their learning and achievement. These projects reflect the AMLE characteristic (Multiple Learning Approaches) suggesting that teachers use multiple learning and teaching approaches in their classrooms. Other teacher research projects focused on meeting the needs of all learners through multiple learning and teaching approaches (AMLE, 2010, p. 22).

Transitions for young adolescents and teachers. Several middle level teachers studied various topics related to transitions. The projects focused on transitions from elementary school to middle school and middle school to high school. Their projects demonstrated the teachers' understanding of the responsibility of school personnel for guiding young adolescents through these major educational transitions (Smith, 2006). These projects reflect the AMLE characteristics, School Environment and Professional Development, suggesting that the school environment should foster purposeful learning and meaningful relationships and that professional development should incorporate best practices (AMLE, 2010, pp. 30, 33). These principles were addressed by teacher research projects which focused on the transition of middle level students or the transition of middle level teachers at different career stages.

Supporting young adolescent thinking and development. A number of teachers' studies focused on topics or interventions that provided young adolescents with experiences intended to enhance their critical thinking and social development. Other researchers provided students with experiences that supplemented the curriculum or engaged students in learning experiences that employed the use of technology, innovative techniques or that considered young adolescents' needs beyond academics. For instance, teachers investigated questions they had about: (a) assessment and the impact on young adolescents' learning; (b) experiential, constructivist or kinesthetic learning; (c) student engagement or motivation; (d) the development of critical thinking skills; (e) the development of young adolescents as reflective and independent learners; and (f) the use of technology to enhance learning. These projects reflect the AMLE characteristic (Value Young Adolescents) suggesting that middle level teachers should value and be well prepared to teach students in grades 4-9.

Connections to the essential attributes and characteristics of middle level environments can be found in each of these themes and in each of the teacher research projects reviewed for this article. This introduces possibilities for future middle level teacher researchers to identify connections between their classroom research and the AMLE attributes or to begin with the attributes as a jumping off point for their teacher research. The process of teacher research reflects best practices as suggested in the AMLE characteristics, and also represents best practices in teacher professional development.

Two Examples of Teacher Research at the Middle Level

The following examples demonstrate the teacher research process from the perspective of the classroom teacher. Kathleen and Denise, two fifth-grade teachers, conducted research on new teaching and learning models (theme one): Academic Choice and the 4-Square Writing Method. The teachers work in a public school in Pennsylvania which enrolls over 6,800 students districtwide. The district consists of 11 schools including six elementary schools, three middle schools, one high school, and one alternative school/cyber-learning academy. Seven schools are classified as suburban, three are classified as rural, and one (newly-opened) is currently non-classified. The National Center for Education Statistics (2012) report that 53% of the students are classified as White/Non-Hispanic and 45.46% (higher than the state average) receive free or reduced lunch. The district is considered diverse in ethnicity and socio-economic status in comparison to districts in the same region.

During their teachers as researchers course, Kathleen and Denise implemented a new teaching and learning model in their classrooms during a two- month period. Kathleen chose to implement Academic Choice, from the Responsive Classroom model, as her school engaged in the use of Responsive Classroom. Denton (2005) describes the Responsive Classroom as a strategy that can help teachers structure teaching and learning. As teachers determine lesson goals, they present students with choices about what and how to approach their learning toward the defined goals in

Denise chose to implement the 4-Square Writing method as a means to improve students' writing organization and length. The 4-Square method is a tool used during the planning stages of writing. A simple graphic organizer helps students to identify the topic, three supporting ideas and a conclusion for their writing pieces. During their inquiries, each teacher collected data on students' experiences using the new model, and analyzed the data they collected to

draw conclusions about their research, informing their teaching practice for current and future students.

Kathleen: Academic Choice in 5th Grade

Kathleen explains her teacher research project. My research project evolved naturally as a result of the training I received from the Northeast Foundation for Children, in the Responsive Classroom approach to teaching and learning. I titled my research: *What* Happens *to Student Motivation, Engagement, and Achievement when Academic Choice Is Utilized in 5th Grade Language Arts Instruction*? I wanted to investigate how Academic Choice, the strategy of allowing students to choose *how* they will learn the required content, because it seemed like such a logical initiative to me. As a proponent of Responsive Classroom, I wanted to expand my skills as well as allow the students to grow by utilizing Academic Choice. I wanted to see if utilizing the Academic Choice strategy would improve student performance and collaboration.

Kathleen describes her research methodology. Participants included 22, heterogeneously grouped 5th grade students. Students were required to utilize Academic Choice in hopes that it would improve their engagement, motivation, and mastery of vocabulary and spelling words associated with the district's curriculum. In order to implement the model, I developed an Academic Choice Planning Guide for vocabulary and spelling. Students were required to complete one activity, of their choice, each day, Monday through Thursday (see Table 2). A 15-minute time block was allotted each day for the students to work on vocabulary independently or in groups. Data including surveys of students, anecdotal records from observations, researcher notes, student work samples, and publisher-constructed tests were collected and analyzed during a five-week period.

Table 2. Academic Choice Menu: Options for Spelling/Vocabulary Practice

#1 Color Words Write each word using a different color for the vowels. (Ex. use red for all the "a's", blue for all the "e's", etc.)	**#2 Crossword Puzzle** Use graph paper and make a "crossword" like puzzle using all your spelling words.	**#3 Alphabetical Sort** Sort all your spelling words in alphabetical order.	**#4 Sentences** Write all your spelling words in complete sentences.
#5 Rainbow Words Divide the words into 5 groups of 5. Then write the words, in cursive, in an arch like a rainbow. The top arch should be red, then orange, green, blue, and purple.	**#6 Step Puzzle** Use graph paper and write your spelling words as if you were making steps. (Ex. If the word was mouse it would look like: M Mo Mou Mous Mouse	**#7 Syllable Sort** Sort all your spelling words into syllables. Write all the one-syllable words in one list, two syllable words in another list, three syllable words in the next, etc.	**#8 Synonyms and /or Antonyms** Write your spelling words and a synonym for each word. Use www.dictionary.com for help.
#9 Color Words Writing Use colored pencils or thin markers and write your spelling words in different colors. Write them once in print, then once in cursive.	**#10 Make a Puzzle** Use http://puzzlemaker.discoveryeducation.com and make and solve a puzzle using all your spelling words.	**#11 Letter Count Sort** Sort all your spelling words by the number of letters in each word.	**#12 3 Times Each** Write every spelling word 3 times.
#13 Fancy Words Write each spelling word in fancy colorful lettering. You may use "bubble" letters or any other fancy fun way.	**#14 Rhymes** Write each selling word and a word that rhymes with it. For example: outcry, apply (Use www.rhymezone.com for help.)	**#15 Word Sort** Sort the list of spelling words by part of speech. For example: by nouns, verbs, adverbs, etc.	**#16 Story** Write a short story using at least 10 of the spelling words.

Kathleen describes her students' learning. Findings indicated that Academic Choice made a positive impact on the students in my classroom. It improved their motivation and engagement; students were willing to complete "extra work" and earn extra credit for completing more than the required activities. It also built a strong sense of community. Students that would rarely interact would actively seek out partnerships and expand their friendship circles. In the area of vocabulary academic achievement, students made significant gains in their knowledge and retention of vocabulary words. The academic average of vocabulary prior to the study was 82%, by the end of the test/research the overall average was 93%. This gain of eleven percentage points, I believe, is directly related to the students working together and using vocabulary as designed in Academic Choice.

Kathleen reflects on her findings related to academic performance in spelling. I was also puzzled by the disparity in academic performance results when comparing vocabulary to spelling. Spelling results did not result in a significant academic increase; it actually decreased. However, students did not work in class or in groups on spelling words. I am now curious to know whether students would have improved if assigned Academic Choice to complete spelling assignments within the classroom (communal context) instead of being limited to homework assignments. Also, I would like to determine if the type of spelling skills studied during the test/research phase had an adverse impact on the potential for a more noticeable change.

At the completion of each study, teachers are asked to suggest implications for their teaching and complete final reflections on their work as researchers.

Kathleen shares her final reflection. Now that I have completed this research, I believe there are definite benefits to utilizing Academic Choice within the curriculum. Students report that they are having "fun" and what is better for learning than enjoyment? As a teacher, there are several different areas, across my curriculum, in which Academic Choice could be positively utilized. I will continue to utilize Academic Choice in vocabulary. I feel confident that if I were to end Academic Choice, my students would protest vigorously. As a result of my work on this research, I have continued to utilize and expand Academic Choice in my 5th grade classroom, and I plan to continue to incorporate the model with future students.
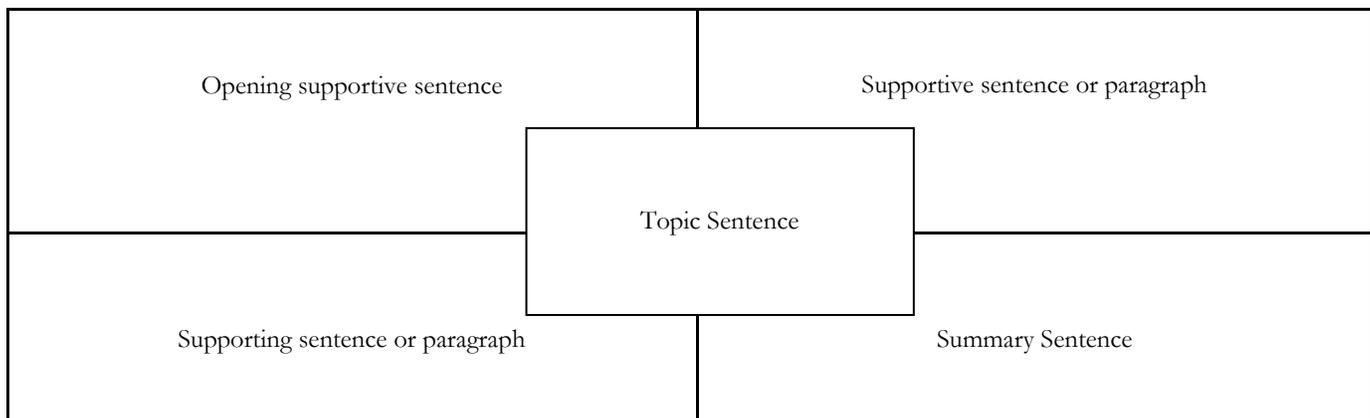
Denise: Using the 4-Square Writing Method in Grade 5

Denise recounts her experience investigating the use of a new model to teach essay organization. Writing essays has always been a struggle for my fifth graders. Many of them had a negative outlook on writing in general. I looked at this action research project as a unique opportunity to learn about 4-Square. 4-Square is a method used for organizing ideas before writing a five-paragraph essay (see Table 3). Appropriately enough, the title of my research project is *Using the 4-Square Writing Method with Struggling Fifth Grade Writers*. After hearing great things about this approach, I decided to take the time to implement it in my classroom and make it the topic of my action research project. In writing this two years after conducting my teacher research project, I continue to see how this research has influenced my teaching and work with my 5th graders.

Denise describes her research. I wanted to implement a new model for students to use when writing, to improve the organization of their writing and quality of their writing. I observed that my 5th graders were struggling with the traditional essay format used in my language arts curriculum. My inclusive and heterogeneous classroom consisted of twenty-eight students. I focused my inquiry on a group of four students who struggled the most with writing essays. These four students were the actual participants in my study, one female and three male. I sought out a model to supplement my daily instruction in writing and selected the 4-Square writing method. I implemented the writing model with my entire class but focused my data collection, organization, and analysis on my participant group of four students.

Denise explains her data collection and analysis process. During my nine week study, I collected and ana-

Table 3. 4- Square Writing Method Graphic Organizer

Opening supportive sentence		Supportive sentence or paragraph
	Topic Sentence	
Supporting sentence or paragraph		Summary Sentence

Note. The 4-Square writing method guides students in brainstorming/draft phase of their writing.

lyzed data to determine if the 4-Square method improves student essay writing performance and attitude toward writing essays. I collected student work samples, recorded field notes during observations of student work, and administered pre-tests and post-tests. I also surveyed and interviewed my student participants. Through analysis of my data, I found two major themes that developed: The 4-Square Writing Method improved my students' overall presentation and organization of an essay, but did not necessarily improve grammar, spelling, and sentence structure. Most students improved from a single paragraph with minimal knowledge evident in their essay, to a well-organized five paragraph essay with indenting, appropriate transition words, and sufficient details related to the given topic.

Denise describes how her students' attitudes changed about writing. I also found that the participants' attitudes about writing essays improved after using the 4-Square Writing Method. They no longer referred to writing as *hard* or *boring*. They all shared that the 4-Square Writing Method improved their essay writing skills. As a teacher, this change in perception was a significant success. Each lesson was interactive, giving my fifth graders a chance to practice each step of the process and share their drafts with peers and with the whole class. It appears that collaboration among peers helped these struggling students learn from more sophisticated essay writers and develop their confidence as writers. The writing framework gave students a model to follow that led to greater understanding of essay organization while developing as independent writers.

Denise reflects on the process. Throughout the entire process of becoming a teacher researcher, my students' needs were always at the forefront. While I only focused on four of my students in this particular project, I knew the 4-Square method would benefit all of my students and therefore involved them in the sharing of this method of organizing information with their classmates. Discovering useful tools to enhance my students' learning is something I strive for everyday. By the end of my research, the majority of my class felt as though they were capable of organizing a five paragraph essay with minimal teacher assistance and actually enjoyed the process. After learning about 4-Square and using it in my classroom, I feel as though I was able to give my students quality instruction on how to successfully organize an essay. My entire class experienced benefits from this method. They have come out with a better understanding of the various components of a successful essay. I am confident they will take the information they learned through this process and use it in Middle School and beyond. From now on, it will be added to my writing curriculum as a means to enhance and support what I am already teaching, and I will continue to encourage other teachers to utilize it.

In each of these examples, it is clear that teachers who are engaged in the research process are able to identify a topic of research that develops from their work with young adolescents, is context-specific, and relevant to their students, their district, and their teaching. Kathleen and Denise have presented their work to school district colleagues, university colleagues, and broader audiences as a way to share their learning about the models they ap-

plied in their classrooms and about their experiences as teacher researchers, also contributing to their ongoing learning and professional growth.

Other Research Conducted by Graduate Students

Other middle level teachers have investigated a variety of topics in an attempt to understand the needs of their middle level learners. Richard, for instance, utilized a semi-structured reflection tool with his 6th grade students in an effort to make connections between teacher and student while promoting students' engagement and perceptions of their learning. Jessica integrated kinesthetic learning experiences in her 7th grade earth science classroom, intending to support middle school students' learning about rocks and minerals and to determine the potential and impact of her adaptations. Thomas examined the technology needs of students transitioning between his 8th grade middle school classroom and the high school setting. Eric examined the integration of interactive white boards in his 7th grade classrooms. In addition to these examples, Table 1 depicts recent teachers' inquiry topics and grade levels and demonstrates the range of interests of middle level teachers who self-selected topics for their classroom research. In all cases, teachers were able to implement quality teacher research projects without detracting from their students' learning, suggesting that teacher research has a meaningful and appropriate position as professional development model in modern middle level classrooms. See Table 1 for a list of more research topics arranged thematically.

Teachers Kathleen and Denise will continue to engage in teacher research during the upcoming school year. They intend to study their teaching and students' learning in guided mathematics, through a collaborative teacher research project. Their ongoing work as teacher researchers is evidence of the efficacy of the teacher research model for ongoing professional growth and improved teaching through continuous classroom inquiry at the middle level. Other middle level teachers in our M.Ed. program who have completed teacher research have developed the same focus on their teaching and their students' learning, suggesting implications for improved middle level experiences.

Conclusion

If educational programs and learning environments for young adolescents are to be developmentally responsive, challenging, empowering, and equitable (AMLE, 2010) teacher research can be used to focus teachers' attention on these essential attributes and characteristics of teaching young adolescents. Teachers are provided with an ever-increasing variety of professional development opportunities; however, many of them lack "connections to the culture of the school and its teachers/students" (Bradley-Levine, Smith, & Carr, 2009, p. 152). Teacher research gives teachers a tool to further understand the young adolescents with whom they work. These connections between teachers and students can be powerful motivators for student learning and success in schools. It is teachers who are in the best position to understand their schools, organizations and students. Through classroom inquiry, teachers are able to (a) ask real questions about middle level students and schools that are grounded in the work they do every day; (b) direct their own professional learning utilizing a well-established professional development and action research model that can be pursued during the regular school day; and (c) work to improve their students' learning and experiences in middle level classrooms.

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