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Active learning in the middle grades

This article offers examples of developing students' participation as a central tenet of ideal middle level education that is intellectually active, socially active, and physically active.

Susan Edwards

What is active learning and what does it look like in the classroom? If students are participating in active learning, they are playing a more engaged role in the learning process and are not overly reliant on the teacher (Bransford, Brown, & Cocking, 2003; Petress, 2008). One definition of active learning is:

The process of having students engage in some activity that forces them to reflect upon ideas and how they are using those ideas. Requiring students to regularly assess their own degree of understanding and skill at handling concepts or problems in a particular discipline. The attainment of knowledge by participating or contributing. The process of keeping students mentally, and often physically, active in their learning through activities that involve them in gathering information, thinking, and problem solving (Collins & O'Brien, 2003, p. 5).

Active learning framework

Advocates for active learning in the middle grades agree that the most lasting learning comes through direct experience and interaction with the intellectual, social, and physical environments (Edwards, Kemp, & Page, 2014; Nesin, 2012; NMSA, 2010). The purpose of this article is to propose the following framework to describe and plan for different types of active learning instruction in middle grades classrooms.

Intellectual. Our primary goal in the classroom should work to get students intellectually engaged with the content. We want students to be intellectually active rather than mindlessly and passively receiving information and just accepting the authority's delivery, whether that authority is the teacher or the textbook. Instructional methodologies that involve actively constructing new knowledge through problem-solving, questioning, and inquiry have long been advocated by leaders in the middle school movement (NMSA, 2010). Active learning requires students to intellectually engage with the content using critical thinking or higher levels of thinking such as analysis or synthesis. In order to promote relevance and relationships, active learning strategies require students to go beyond memorization or basic comprehension and understanding, and move toward more active types of thinking such as those at the upper end of Bloom's Taxonomy that require students to apply, analyze, evaluate, and create (Anderson & Krathwohl, 2001).

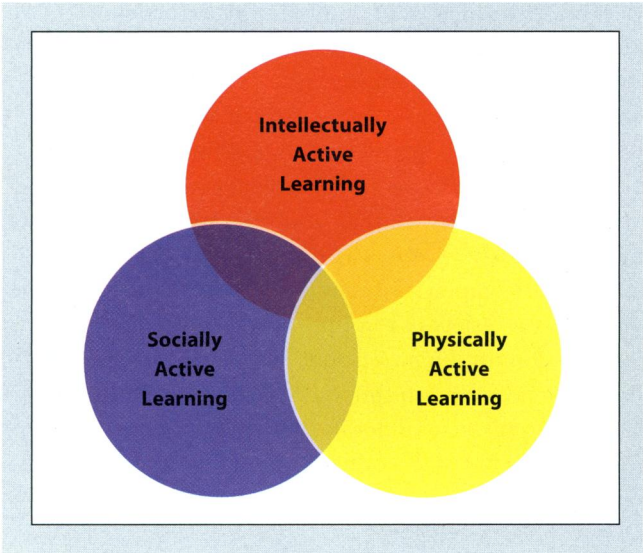
Young adolescents have an intense curiosity about the world around them and are trying to make sense of that world. Instructional strategies that capitalize on that curiosity and require students to actively make sense of the content are ideal for the middle grades. Instruction is most effective when teachers use that curiosity to build on the existing knowledge students bring to the classroom (Nesin, 2012). Active learning strategies such

as problem-solving, higher-level questioning, inquiry, concept maps, synthesizing research for papers or presentations, synthesizing what they have learned for multimedia projects such as Voicethreads, Glogsters, or Prezis, puzzles, brainteasers, and interdisciplinary projects work well for this.

Social. Intellectual involvement alone with content isn't enough in a successful middle school; at the developmentally-sensitive ages of 10–15, young adolescents are peer-oriented and allowing students to work collaboratively is a significant aspect of classrooms that are aligned with the middle school concept (AMLE, 2012). Getting students socially active can be as simple as having partners discuss a question about the content, but can be more involved such as having small groups of students work on a unit project. Small group activities that allow middle level students to work with each other as they learn content are engaging to young adolescents (Nesin, 2012). Small group and whole class discussions are also methods for getting students socially active in their learning (Edwards, 2014).

Physical. Young adolescents are typically active and energetic, and physical movement in the classroom is important as well. Since a lot is happening in their physical development as a result of puberty, students need opportunities to move during lessons. Active learning strategies such as experiential learning, manipulatives, experiments, building models, and hands-on projects engage middle level students (Nesin, 2012). Kim Campbell (2014) shares a wide range of activities she uses in her classroom to get her students involved physically in active learning such as board games and creating videos.

Figure 1 Active learning framework



Certainly, you can be intellectually active at the same time that you are socially active and/or physically active. It is possible for an instructional method to fit in more than one category at the same time. For example, if students are asked to work in small groups to create a project that involves collecting data in a nearby pond and to analyze their data to draw conclusions about the ecosystem, they would be engaged in intellectual, social, and physical active learning simultaneously. But it is also possible for an activity to fit into just one category such as students individually creating a concept map of the chapter they just read.

It is also important to note that the instructional activities selected for a lesson should not only involve

Figure 2 Examples of intellectual, social, and physical active learning strategies

Intellectually Active Learning	Socially Active Learning	Physically Active Learning
<i>Instructional Strategies</i> <ul style="list-style-type: none"> • Concept Maps • Inquiry Activities • Problem-solving Activities • Synthesizing research for presentations or papers • Creating multimedia presentations synthesizing what they have learned 	<i>Instructional Strategies</i> <ul style="list-style-type: none"> • Whole Group Discussions • Small Group Discussions • Small Group Projects 	<i>Instructional Strategies</i> <ul style="list-style-type: none"> • Lab experiments • Hands-on projects • Games • Building models • Manipulatives

active learning, but should be purposeful as well (NMSA, 2010). The goal is not activity for activity's sake or to make the lesson fun. It is not achieved by simply incorporating some games or fun activities into a lesson plan. Clearly, every activity in a lesson should lead to purposeful learning of the lesson objectives and the standard to be met. The goal should be to empower students with critical thinking skills versus just memorizing knowledge. In an active learning approach, students are empowered to uncover information on their own using a variety of resources, to grapple with new information until it makes sense, and to create new ideas using the information they have learned. Students also learn the tools that empower them to be lifelong learners who are capable of discovering and applying new ideas on their own.

Teachers who implement active learning in their classrooms

Research findings support the assertions of this article regarding the importance of active learning as an integral strategy for successful middle level practice. With a focus on nine middle grades teachers who exhibit active learning through multiple approaches in their classrooms located in five middle schools in four different school systems in the southeastern United States, a research study (Edwards, 2015) sought to understand what barriers these teachers had in implementing the AMLE instruction principles and how they overcame those barriers. Data collection included classroom observations, interviews with the teachers, and samples of lesson plans. As a result of the interviews and classroom observations of these teachers we can get a glimpse into what the AMLE active learning principle looks like in practice. Let's take a closer look into the classroom instruction of four of these teachers.

Meet Kadisha Washington, a middle grades mathematics teacher

Kadisha (pseudonyms have been used for all of the teachers and their schools) has been teaching fifth grade mathematics for five years in an urban Title 1 school that has 99% of its students on free or reduced lunch. The school serves primarily African-American students with 99% of the student body identified as African-American and 1% identified as Caucasian or multiracial.

She teaches two mathematics classes per day. Her morning math class has 24 fifth graders of average to below-average ability. Most of the students are functioning below grade level and are missing many pre-requisite skills for her fifth grade curriculum. However, she does have a few students who are right on track with her curriculum and are doing well in her math class. Kadisha also has a remediation math class in the afternoon. This is a school-wide effort to add an intervention period at the end of the day and regroup students based on benchmark tests scores. Kadisha has 12 students in her remediation class, and they are assigned to her because they are struggling in mathematics and have very low benchmark scores.

Kadisha strongly believes in active learning. Here is what she says about the importance of active learning in her mathematics classroom:

Math class can't be boring. Because I don't like lecture myself, I like to do different things when I'm in class. So I think about my children being myself and when I was in school, somebody just sitting in front of me just talking, talking, talking, it wasn't reaching me. And I realize that you need to be up, you need to be moving, they need that chance to talk about the math, they need to discuss and get frustrated with the math together because that's part of social development anyway. I can't expect them to sit here and be quiet all the time.

Kadisha also believes it is important to utilize multiple learning approaches in her classroom. She believes that everyone does not learn math the same way and regularly implements a variety of strategies including videos, drawing pictures, manipulatives, computer software, games, demonstration, and worksheets.

Solving problems on a Coordinate Plane in Quadrant 1

What This Lesson Might Look Like Using a Passive Learning Approach:

1. A bellringer problem is on the board. Students write the coordinates of 3 points on a coordinate plane individually and then the teacher goes over the answer with the class.
2. The teacher introduces solving problems on the coordinate plane with a Powerpoint and has students copy key vocabulary terms and their definitions in their notebooks.

3. The teacher demonstrates some problems and then has students do an example problem and then explains the correct answer to the class.
4. Students practice 20 problems of varying levels of difficulty in their workbooks.
5. The teacher goes over the answers to the 20 problems and gives the students the opportunity to ask questions.

This lesson plan is an example of a traditional, passive approach to instruction. The students are relying on the teacher as the authority so are limited in their level of intellectual engagement. Since they take notes and complete the worksheet individually, they are not socially active. Nor is there any physical activity built into the lesson for the students. However, this same topic could be taught using active learning strategies as seen in Kadisha's classroom:

How Kadisha Taught this Topic Using Active Learning:

1. The whole class plays an interactive game on the Promethean Board with different students taking turns coming to the board. Rather than simply plotting points, the game questions ask students to think logically such as, "Which direction will the point move if I make the x-coordinate bigger?" (Intellectually, Physically, and Socially Active)
2. Vocabulary in math journals: students come up with their own student-friendly definitions based on explanations from the teacher. (Intellectually Active)
3. Students rotate through stations in small groups:

Station A. Students plot 4 points on a coordinate grid, connect the points and say what geometric figure is formed. What line segments are parallel? What line segments are perpendicular? etc. (Intellectually and Socially Active)

Station B. Students work together to solve word problems on a worksheet. (Intellectually and Socially Active)

Station C. Students explain a path from the school to the town library, using points on a coordinate plane. They can move magnets around on a giant coordinate plane with pictures of town buildings superimposed on the coordinate plane. (Intellectually, Socially, and Physically Active)

Station D. Interactive game on the Promethean board (Intellectually, Socially, and Physically Active)

Kadisha had the students engaged intellectually throughout every activity. She also had them engaged in

social activity as they rotated through the stations in small groups and worked together on each of the activities. In addition, she had them engaged in physical activity using the interactive game on the Promethean Board and in two of the learning station activities. Kadisha was able to engage her students in an active learning approach while leading them to mastery of the coordinate plane standard she was charged with teaching.

Meet John Morales, a middle school language arts teacher

John is in his second year of teaching eighth grade language arts at a rural middle school. Southeastern Middle School is a Title 1 school with 71% of the students on free and reduced lunch. The school is approximately 50% African-American and 50% Caucasian, with just a few students identified as Hispanic. John teaches four periods of eighth grade language arts per day and his classes average around 25–30 students.

John believes in using active learning to engage his students. He has observed that students tend to become disengaged when assigned workbook pages, but become more engaged when active learning strategies are used. John also incorporates multiple learning approaches in his classroom. As a former communications major, he especially enjoys bringing technology into his lessons. He enjoys creativity and capitalizes on his creative ability to approach topics from a variety of methods including story-telling, videos that his students star in, videos that his students create, cooperative learning, student journals, audio books, and authentic experiences.

Verbals: Gerunds, Participles, and Infinitives

What This Lesson Might Look Like Using a Passive Learning Approach:

1. The teacher introduces new vocabulary terms.
2. The teacher displays example sentences and asks students to identify different terms. (i.e., "What is the gerund in this sentence?")
3. The students complete a worksheet with 20–25 sentences and identify vocabulary terms within the sentences.
4. The teacher goes over the answers to the worksheet with the whole class.
5. The students are assigned a page in the "grammar book" for homework.

This lesson plan is yet another example of a traditional, passive approach to instruction. The students are relying on the teacher as the authority so are limited in their level of intellectual engagement. Since they take notes and complete the worksheet individually, they are not socially active. Nor is there any physical activity built into the lesson for the students. However, this same topic could be taught using active learning strategies as seen in John's classroom:

How John Taught the Topic Using Active Learning:

1. John introduced vocabulary terms using a Powerpoint.
2. John displayed sentences on the board, related to the vocabulary terms. The students give their answers by holding up fingers, (i.e., hold one finger up if it is a gerund and two fingers up if it is an infinitive).
3. Using a multimedia presentation with videos and pictures of the students, each accompanied with a sentence (i.e., "The sleeping boy was suddenly awakened by this teacher."): Students had to identify verbals in each example, individually in their notebooks. (Intellectually Active)
4. The class discussed the answers. John asked students to change sentences as he called on them. For example, asking a student to change one sentence from passive voice to active voice. (Intellectually Active)
5. The students work in small groups to create their own video with sentences using verbals. (Intellectually, Socially, and Physically Active)

John had the students engaged in intellectual activity throughout the lesson. He also had them engaged in social and physical activity in the group project where the students created their own videos. John was able to engage his students in an active learning approach while leading them to mastery of the standard about verbals that he was responsible for teaching.

Meet Elizabeth Butler, a middle school science teacher

Elizabeth teaches seventh grade science at Reynolds Middle School, a suburban school that serves mostly middle and upper class students, with only 10% of the student body on free or reduced lunch. The school is predominately white (73% of students) with the other 27% of varied ethnicities (African-American, Asian, Hispanic, Native American, and multi-racial). Elizabeth is in her 25th year of teaching and has taught at three

very different middle schools. She loves science and endeavors to instill that love of science to her students.

Elizabeth admits that it is more difficult to do active learning now than years ago because the curriculum guides and benchmark testing schedules are so rigid, but she is still committed to it because she believes it is absolutely critical for middle level students to learn. She works hard to obtain the materials and activities to engage her students in meaningful, hands-on projects because she "wants them involved in their learning." Elizabeth believes, "if they're engaged in a lab, that's the only way to see that science concept come to life."

Elizabeth is also committed to using multiple learning approaches in her classroom. In any given lesson you may see the following: labs, lectures, worksheets, note-taking, workbooks, games, videos, inquiry activities, projects, reading from the textbook, etc.

Dichotomous Keys

How Elizabeth Taught the Topic Using Active Learning:

1. Elizabeth asked the students questions about the Order of Classification that they learned yesterday. They referred to the foldables they made in class for the answers.
2. Elizabeth had the students get out a sheet of paper and write the Order of Classification.
3. Elizabeth explained what a dichotomous key is by calling four students up to the front, two boys and two girls. The class divided them up by characteristics (i.e., girls/not girls, pierced ears/not pierced ears) (Intellectually and Physically Active)
4. The students completed a worksheet with pictures of crazy monsters and filled out the corresponding dichotomous key. The class discussed the answers.
5. The students worked in partners and each group was given a baggie of shells. They had to create their own dichotomous key for the shells in the bag. As they finished their keys, they raised their hands and Elizabeth checked behind them. The dichotomous keys were turned in at the end of class. (Intellectually, Socially, and Physically Active)

Elizabeth had the students engaged in intellectual, social, and physical activity by having the students work through actual examples of shells with each other. She continually pushed them in intellectual activity throughout the lesson by using an inquiry approach. In many cases she

scaffolded students with questions rather than just giving explanations. For example, while working on the shell activity a pair of students got stuck and wanted Elizabeth to tell them the next step. One of the students asked, "How are we supposed to split these up next?" Instead of just giving the students an idea of how to proceed, Elizabeth responded by saying, "That is what you are supposed to tell me. You put them into groups by shape already, what are other characteristics of shells?" After some encouragement, the students determined they could separate them by color. Elizabeth was able to engage her students in an active learning approach while staying in line with the district curriculum pacing guide that she is required to follow.

Meet Kristen Miller, a middle school social studies teacher

Kristen is in her 9th year of teaching social studies and is currently teaching eighth grade at a suburban middle school. Grifton Middle School is located close to an army base and therefore serves a transient population of students (46% white, 34% black, 4% multiracial, and 2% Asian). With 52% of the student body receiving free or reduced lunch, the school qualifies as a Title 1 school. Kristen teaches four periods of eighth grade social studies per day to large, heterogeneous classes of more than 30 students.

Kristen believes strongly that it is her job to keep her students engaged in purposeful, active learning and maintains high expectations for her students as she tells them, "I will not give you an activity that will waste your time, but you've got to give me 120% while you're in here."

Kristen uses a variety of instructional approaches in her classroom. She believes, "It's our job to ensure that they understand the concepts that they are supposed to learn in our class, and not everybody learns the same way." She uses a variety of pedagogical techniques including, Powerpoint, games, repetition, projects, hands-on activities, whole group discussions, small group discussions, thinking maps, videos, etc.

Key Issues that Led to the Civil War

What This Lesson Might Look Like Using a Passive Learning Approach:

1. Teacher lectures using a Powerpoint.
2. The students take guided notes.

3. The students read a section in the textbook.
4. The students answer questions at the end of the section.

As with the other passive examples given earlier, this same topic could be taught using active learning strategies as seen in Kristen's classroom:

How Kristen Taught the Topic Using Active Learning:

1. The class played a quiz bowl game using buzzers. Everyone rotated through two teams of five facing each other (for each round of the game a different set of 10 students are at the buzzers). Kristen asked questions found at the understand, apply, and analyze levels of Bloom's Taxonomy and called on the student who buzzed in first. Kristen continually required students to explain their answers and asked additional probing questions of the class regarding the topics. For example, at one point in the game she required the class to expand on a student's definition of the term "campaign." She asked if other students could incorporate the word "battle" into the definition. She stated to the class, "This is where I need you to think. You all are smart and you can rattle off answers. But I need you to make connections. This is where you will go to the next level of smartness." Katherine constantly encourages the students as she pushes them to be intellectually active. (Intellectually, Socially, and Physically Active)
2. The game was interrupted from time to time with two activities: Heads Down Quick Poll (a self-assessment strategy) and repeating the correct answer three times.
3. Students worked with partners on projects where they created newsletters with articles and illustrations. (Intellectually and Socially Active)
4. Homework Brag sheet: List of topics that students must sit down with parents and explain what they know about each. Kristen also sent answer sheets for parents so they could sign off that their student knew the material. (Intellectually and Socially Active)

Kristen had the students engaged in intellectual activity throughout the lesson. For example, she did not have the students play a game just to have fun. She ensured that the students were engaged in higher level thinking by the questions that she asked. She also had them engaged in social activity as they worked on their projects and as they explained what they had learned to their parents. In addition, she had them engaged in physical activity during the game at the beginning of class. Kristen

was able to engage her students in an active learning approach while leading them to mastery of the standard about the Civil War that she is required to teach.

Conclusion

Young adolescents learn through a variety of approaches, and all of those approaches have merit. While this article does not suggest that passive learning approaches should be completely eliminated from middle grades classrooms, it does suggest that they should not be relied on as frequently as they are in many classrooms. Young adolescents need intellectually engaging learning activities, socially engaging learning activities, and physically engaging learning activities. The active learning framework is a way of thinking about planning for instruction that is purposeful and worthwhile for young adolescents. By incorporating carefully selected intellectual, social, and physical activities into the middle grades classroom, teachers can meet the unique developmental needs of young adolescents while teaching the important content these students need to learn to be empowered to think critically about the world around them. Incorporating all three of these into lessons will not only create a better learning environment and different learning opportunities for students, but it will also bring more excitement and enthusiasm into any middle grades classroom.

All of the teachers highlighted in this article were able to meet the standards that they are responsible for teaching. In some cases these were Common Core Standards, and in some cases these were state standards. Through selecting purposeful active learning strategies, they were able to help students achieve the required standards, while at the same time incorporating active learning.

John Dewey describes learning as “something an individual does when he studies. It is an active, personally conducted affair” (1924, p. 390). There is a difference between learning facts and learning to do something with those facts. If we expect students to apply the knowledge they are learning in our classrooms, then

we must help them develop the intellectual tools and problem-solving skills necessary to practice doing something with what they are learning (Michael, 2006). Students learn by becoming involved (Astin, 1985). When we involve students in learning activities that require them to be intellectually, socially, and physically engaged, they will retain the content we want them to remember better. Active learning is more likely to achieve meaningful learning, which will empower students throughout their lifetimes.

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