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An Aesthetic Approach to Teaching Middle School Science

Michael Mueller, Assistant Professor, Roane State Community College
Michael Bentley, University of Tennessee

If we move beyond the idea that doing science consists of an exclusive scientific method, we may better persuade our students to design ways of exploring the natural world in their own right. Today, students need opportunities to experience doing science in gender and cultural sensitive environments. The reality is that science is much more than a rational process; it involves re-creation and imagination, as is so well illustrated by Michael White (1999) in his description of Newton's 18 months of work on the *Principia*. In *The Arts and the Creation of Mind* (2002), Elliot Eisner reminds us that, . . . the arts are among the resources through which individuals recreate themselves. The *work* of art is a process that culminates in a new art form. That art is the recreation of the individual. Recreation is a form of *re-creation*. The arts are among the most powerful means of promoting re-creation (p. 241).

Thus, we might construct a classroom environment where middle school students value and enjoy doing science, see it through constantly refreshed lenses, and are afforded opportunities to explore some of their own science interests. Such opportunities may be liberating for students in a time when standards and high stakes tests push teachers into covering the content by overuse of textbooks. By using the arts as medium in our science classrooms, we provide opportunities for students to examine the quality of their experiences, to open doors of discovery, and to invigorate a more aesthetic way of being.

These learning opportunities may help students conceive their educational experiences in personal terms. John Dewey (1966) noted that,

" . . . since growth is the characteristic of life, education is all one with growing; it has no end beyond itself. The criterion of the value of school education is the extent in which it creates a desire for continued growth and supplies means for making the desire effective in fact" (p. 53).

Integrating the natural sciences and the arts in our science teaching stimulates in students' desire to learn. Desire to learn becomes the momentum that helps students develop "connections to others, the earth, and to important ideas" (Girod, Rau, & Schepige, 2003, p. 577). The arts foster an appreciative way of knowing the natural sciences involving the entirety of human personality.

The arts serve as the stimulus for reflection and critique so that we may partake more fully and more deeply in the experience itself. These experiences can rejuvenate our scientific vigor and take us on journeys of science exploration that we value and aspire to. In working with the arts, teachers and students alike develop an engagement with and passion for the subject matter. It is the love of the teacher for the process and products of the discipline that catalyzes interest in students and 'turns them on' to learning in that discipline. This can be a powerful approach in science teaching and actually represents the revitalization of an early concept in science education.

The Arts and the National Science Standards

In the 19th century, science classes were often justified on the basis of a search for truth and beauty in nature (DeBoer, 2000). Students studied the natural sciences to

develop an “appreciation for the great variety of plants and animals, the fascinating intricacies of animal behavior, the natural beauty found in geologic formations, and the mysteries held by sea and sky” (p. 593). Educational growth was based on aesthetic experiences in relation to the natural sciences. Today, in many science classrooms there is an unnecessary split between the natural sciences and the arts. This split may inadvertently perpetuate a science process that does not define the ways in which all students aspire to do science (Brickhouse, 2001). In addition, this split may limit the development of essential exploration and inquiry-based skills. However, integrating science and the arts provides a way of healing the split, as well as providing a context for students to explore and question methods of doing science, not limited by an exclusive or universal process, and more true to the idea that science is a human endeavor.

This split between the natural sciences and the arts does not have to be the case; it wasn't for many famous scholars of the past. Leonardo da Vinci (1452-1519) integrated science, engineering, architecture, and art in many of his great works and inventions. Barbara McClintock (1902-1999), Nobel Prize winning geneticist, described her specimens in beautiful and relational ways (Thayer-Bacon, 2000). And, James Watson and Francis Crick did not follow a single scientific method in their highly regarded work to crack the DNA code in 1959 (Richmond, Howes, Kurth, & Hazelwood, 1998).

If we want to discover ways of doing science that we value, then we might work with a medium outside of a linear scientific method. Maxine Greene (1994) states, ...if I had the opportunity, I would insist that every teacher (like every student) should have an opportunity to work with at least one medium to mold, to carve, to detail, to embody feelings somehow. No matter what the degree of insufficiency, the very effort to say how it was, how it is, by means of words, to transmute a startling perception into an image, to express a feeling through an arrangement of chords, somehow brings us into the heart of the artistic-aesthetic. We may not succeed. We may not complete what we went to complete. But we *know* in some measure; and we rediscover what it is to move beyond, to question, and to learn (p. 503).

Greene reminds us that participation in the arts moves us beyond the here and now. Thus, students become unable to move or act without the continuous momentum to reflect, to critique, to value experiences. A stagnant student has already arrived and does not see the need for future development, growth, or achievement. In essence, living through the arts becomes the meaningful purpose of learning in the science classroom.

Therefore, it should not come as a surprise that Eisner (2005) suggests that the arts “are deeply engaged in the development of mind” (p. 10). He urges teachers to use the arts to develop students' abstract thinking abilities and reason. Eisner notes that “the arts – both in creation and in appreciation – require the use of our faculties of abstraction in order to make judgments about relationships” which open the mind to unlimited possibilities (p. 10). He warns us that curriculum is a mind-altering device that provides opportunities for certain forms of experience and that “a life without the arts is an impoverish life” (p. 10). Others, such as Cobern and Loving (2000) see a connection with the arts as one vehicle for incorporating multicultural education into the curriculum. The arts are a way to ‘hook’ children into learning content that may be underrepresented among the interests of adults in their neighborhoods and communities.

Thus the National Science Education Standards (NRC, 1996) state that teachers of science should “encourage all students to participate fully in science learning” and should foster “curiosity” (p. 32). This curiosity can be unleashed by the arts! The arts do much to provide a context where students have opportunities to “design the learning environment” and display “respect for the diverse ideas, skills, and experiences of all students” (pp. 43-46). Furthermore, the arts may assist students in developing the “abilities needed to do scientific inquiry” and to come to understand that there is no one way to do science (p. 143). And, equally if not more importantly, the arts provide a context for students to experience science as a human enterprise, and not be alienated from science as an integral aspect of our 21st Century culture. Thus, teachers might help students embrace their aesthetic experiences, so that they may enjoy and grow in the science classroom through the arts.

Integrating the Natural Sciences and the Arts

Have you ever seen a piece of petrified wood? The colors embedded in stone are a perfect example of the aesthetic aspects of the natural sciences. What appears as old wood or new rock is neither, but both. Lightning blues and greens, striking reds and calming orangey yellows abound within circular tree rings. These rings, when examined closely, reveal the dendrochronology or annual life history of the specimen – hot and dry season, cool and wet season, and wildland fire. This specimen evokes adjectives from the passionate and imaginative person. However, students in our science classes may not explore beyond the obvious if we tell them that this fossil represents petrification. So how do we integrate the natural sciences and the arts to expand our students’ thinking?

Begin with the links between the natural sciences and the arts. The arts help us to perceive the world more accurately; to reflect and critique our own ideas, and to observe the relationships between facts (Eisner, 2002). Eisner warns us that labels and language may limit students’ ability to see what they are looking at. In many science classrooms, specimen labels and procedures are already firmly established. However, to get beyond these limitations, we can encourage students to use and invent words, metaphors and similes, as a way to get past labels and inhibitory language. Class activities might include the painting of plants in a school garden or terrarium as they change through the year, sculpting an insect out of clay as it metamorphoses, or sketching the intricacies of a crow’s feather. The focus would be on seeing deeply, beyond the obvious.

The teacher can foster an understanding of the natural sciences through its aesthetic aspects. Often, students have had negative experiences learning science and may not imagine science has any place in their lives. The teacher can show them that the natural sciences can be experienced as an inspiring and passionate endeavor. For example, Annie Dillard (1974) has written beautiful nature prose and Lewis Thomas (1974a, 1974b) and Art Stewart (2003, 2005) have written poems related to science. These poems could be used in middle school science classrooms, and of course, students could be encouraged to write science and nature poems themselves.

The teacher can help blur the lines between students “in-school and out-of-school learning experiences” (Girod et al., 2003, p. 585). The implication is that wherever students go - to a museum, historical site, or national park - beauty as well as connections to the natural sciences can be perceived in their surroundings. Class activities might include taking field trips, cooking up recipes for ecosystems, designing a theatrical play

based on heliocentrism, or creating a dance that demonstrates inertia. Performances such as the latter can make ideas come alive and fuel students' aesthetic appreciation.

A final component is developing aesthetic inquiry. Teachers can engage students in exploration and inquiry where the process is not judged by an exclusive and linear scientific method. Teacher and students can embark together on journeys of aesthetic inquiry. Irwin (2003) describes aesthetic inquiry as the highly desired skill of moving into the unknown with the anticipation of finding intrinsic rewards and excitement in the process. She emphasizes that this journey is an unfolding process of disruption and surprise. For example, students often design an investigation only to find out while doing it that it needs adjustment, balance, and fine-tuning. This outcome may frustrate many as they continue doing science, but for those who appreciate science as part of an aesthetic approach, this process is understood to be necessary and can even become pleasurable. "Aesthetics is about slowing down and attending to the qualities of our experiences" (Irwin, 2003, p. 74). In this approach, the teacher and student learn from each other and there is great enjoyment as the course is charted. Class activities might include reflective diaries documenting the field experiences of students, portfolios with a collection of specimens used for investigation, and field journals mapping the abundance and location of minerals on a mountainside. The focus is more on the *process* of engaging students in the aesthetic experiences of the investigation instead of the *product* that emerges from the inquiry.

Again, evaluation in this approach resides within the process rather than the products. It is in the enjoyment of the experience that each student's aesthetic competence, unique inquiry and exploration skills, and passion are developed. Thus, evaluation is based in the context of artistic-scientific representations and performances - reflection and critique. For the teacher, it is a participatory act, similar to the art of producing a documentary film. The teacher attempts to capture whatever background or context is necessary to provide a "relatively accurate understanding of the specific events being depicted" (Hickey & Zuiker, 2003, p. 549). The teacher might use a reflective journal to collect anecdotes regarding student work and notes about the environment that led to each student's accomplishments. In this way, we all as teachers also *desire* a more aesthetic way of knowing in our educational practice which continues to grow with experience.

The purpose of integrating the arts in the science classroom is to revive and cultivate in our students a passion for aesthetic experiences with the subject matter of the natural sciences. This passion starts with the teacher and spreads, student to student. It is these experiences that will lead our students to academic success and set the drive for future achievements. Teachers who learn to integrate the arts in their own classrooms will likely come to appreciate more the complexities of their educational practice. This kind of curriculum work expands one's perception and moves us well beyond the prescribed standards-based content of the curriculum, and ultimately, may change the way in which our students view the natural world.

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Size Matters: The Impact of School Size on Middle School Parents' Perceptions of the Middle School Assistant Principal

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Abstract

This study investigated the similarities and differences between middle school parents' perceptions of the middle school assistant principal. The researcher asked investigated two groups of parents. The first group of parents' children attended small middle schools. The second group of parents' children attended large middle schools. The results from the study indicated that there were more favorable perceptions of the middle school assistant principal among parents with children enrolled in small middle schools. The researcher provides a summative theory that explains this difference.

Introduction

The principal and assistant principal are two of the most influential leaders of a middle school. Unlike the principal, the assistant principal is one of the most overlooked and under researched positions of school leadership (Weller & Weller, 2002). I decided to address this issue by investigating the perceptions of the middle school assistant principal. I centered my investigation on two research questions. They are as follows:

1. What are middle school parents' perceptions of an effective middle school assistant principal?
2. Do these perceptions differ in accordance to the size of the school?

I used this framework to create two additional questions. The first question was "What are the characteristics of an effective middle school assistant principal?" The second question was "Identify the roles and duties of an effective assistant principal."

I posed these questions to 485 middle school parents. Two hundred thirty parents had children who attended large middle schools. I defined large middle schools as institutions with an enrollment of less than 600 students. Two hundred fifty-five parents had children who attended small middle schools. I defined small middle schools as institutions with an enrollment below 600 students. Each group consisted of parents from different educational backgrounds, socioeconomic statuses, and ethnicities.

Results

Question One: What are the characteristics of an effective middle school assistant principal?

Middle school parents of children in small middle schools used the following words to describe an effective middle school assistant principal:

1. Child Advocate
2. Problem Solver
3. Consistent
4. Role Model

5. Trustworthy

Middle school parents of children in large middle schools used the following words to describe an effective middle school assistant principal:

1. Accessible
2. Flexible
3. Available
4. Visible
5. Respectful

Question Two: Identify the most important duties of an effective middle school assistant principal.

Middle school parents of children in small middle schools indicated that the roles and duties of an effective middle school assistant principal are to:

1. Maintain positive learning environment
2. Hire good teachers
3. Work with teachers
4. Support Principal
5. Discipline students

Middle school parents of children in large middle schools indicated that the roles and duties of an effective middle school assistant principal are to:

1. Pay attention to students
2. Prevent bullying and harassing
3. Involve parents
4. Return phone calls
5. Discipline students

Discussion

The results from the interviews indicated that both groups held vastly different perceptions of the middle school assistant principal. Parents of children in small middle schools used inspirational words to describe the characteristics and duties of an effective middle school assistant principal. They believed that the middle level assistant principal is a role model who nurtures a positive school climate. Parents of children in large middle schools used managerial words to describe the characteristics and duties of an effective middle school assistant principal. They believed that an effective middle school assistant principal is consistent disciplinarian who maintains a safe environment.

These differences may be related to Deal and Peterson's (1994) technical and symbolic theory of school leadership. They theorize that school leaders must have a technical disposition and symbolic disposition. School leaders use the technical disposition to manage schools. They use the symbolic disposition to inspire change in schools. Deal and Peterson further specified that most school leaders simultaneously use both leadership characteristics to lead schools. I think that the parents of children in small middle schools had a stronger symbolic attachment than technical attachment to their views of leaders. The parents of children in large middle schools had a stronger technical attachment than symbolic attachment to their views of leaders. Their responses strongly suggest that these differences are resultant of the size of the middle school.

Most school leaders of large middle schools have a difficult time in establishing meaningful relationships with parents (Woodham, Personal Communications, June 7, 2005). The reason is that many parents indicate that their children are often overlooked in large middle schools. Parents feel that their children are recognized and valued in small middle

schools. As a result, many parents prefer to enroll their children in small middle schools instead of large middle schools.

The results of this study lend credence to this theory. As a primary example, the parents of children in large middle schools remarked that effective assistant principals do pay attention to the students. It appears that they perceive their current middle school assistant principal as being out of touch with the interests and needs of the students. This issue was not a problem for the parents of children in small middle schools. In all probability, the reason is densely populated middle schools may provide their assistant principals with ample time to interact with all of the students. The heavily populated middle schools may prevent their assistant principals from giving enough time to each situation that involves students. Notwithstanding, additional research should be replicated in other parts of the country. That way, we will be able to better define the assistant principal perceptual differences between both parental groups.

Summary/Conclusion

Weller and Weller (2002) state that the assistant principal is a key part of the middle school leadership team. The results from this study indicate that the school size impacts how parents view the characteristics and duties of these leaders. According to this study, parents of children in small middle school have more interpersonal views of middle school assistant principals than do parents of children in large middle schools. Notwithstanding, middle level assistant principals of both campuses play a huge role in protecting and serving students.

This study indicates that they must inform parents of the significance of their positions. As community liaisons, assistant principals should take every opportunity to establish effective communications with parents. In particular, assistant principals should continuously inform parents of how they influence children's pursuit of academic achievement. This communication may instill parents of children in large middle schools with more favorable perceptions of the middle school assistant principal. It may also show them that the sensitivity instead of size can determine the assistant principal's ability to contribute to the development of child-centered middle schools.

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Economically Sound Counseling: Do Our Dollars and Cents Make Sense?

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Abstract

In this paper, I will make a compelling case for five key areas of education in which Tennessee school counselors have played an instrumental and integral role to assist students with personal/social and academic development: character building, mentorship, violence and substance abuse prevention and reading literacy. Using the most current documentation on state government budget expenditures and various program successes reported by educators, a comparative analysis will prove worthwhile investments in our School Counseling Services. Finally, a comprehensive evaluation of these statewide efforts culminates in a concluding summary.

What do we spend on school counseling and why?

Within the last academic school year, the State of Tennessee has cut back on its monetary appropriations to Social Services Support, which includes School Counseling. Reasons given vary greatly, but principally this decrease in available funding can be attributed to greater emphasis on core subject area testing and increases in Special Education Services offered. Generally, for every expansion there must be a complimentary condensation to maintain balance. Whatever the justification, quite possibly the amendment occurred due to lack of understanding and appreciation for strides made in Counseling across the state. Given the perception to be subsidiary programming, many gains in this area are not recognized as valuable, and often state officials view the annual allotment as wasteful.

Out of a \$6, 073, 640, 935 total State Department of Education Budget, \$195, 344, 755 is allocated to Student Mental Health Services, approximately thirty percent (<http://www.k-12.state.tn.us/2sr0203/finsumms.html>)! This fraction should hardly seem excessive. A tenable argument exists for the utility of our portion. The million-dollar question is, “How are we mainly using our money and what are the results?” This is a reasonable inquiry with a multi-faceted answer.

By and large, over the past five years, school counselors have had the greatest social and academic achievements with students through character education, mentorship, violence and substance abuse prevention and reading literacy. Undoubtedly the positive outcomes of program implementation in these areas far exceed the costs incurred, as you will see in the coming pages.

Character building is among the most widely debated topics in Education today. Disputes commonly center around its purpose, composition and execution. For clarity, here “Character Education” will be defined according to the six tenets propagated by the CHARACTER COUNTS! (2003) youth-ethics initiative: trustworthiness, respect, responsibility, fairness, caring and citizenship. Instilling moral and ethical values into our student population is an extremely difficult task primarily because this particular

generation is marked by pervasive unscrupulous behavior. Thus to cultivate the integrity we wish for them to exhibit, collaborative efforts are essential.

The Tennessee Education Partnership is a coalition of numerous K-12 public school systems organized to develop and implement successful character education programs in Tennessee's schools through which students learn and practice standards of conduct and behavior that reflect community values and build elements of character including caring, civic virtue and citizenship, justice and fairness, respect, responsibility and trustworthiness (<http://www.state.tn.us/education/sp/spchedover.html>)

The official launch of this campaign began in 1999, and presently Pilot sites are in sixteen school districts, Memphis City included. By 2004, the state legislators anticipate the following components being in effect: diversity-oriented programs, data collection procedures for program evaluation, measurement and assessment tool means, standardized guidelines, and strategies for on-going growth and program advancement. This project is funded under Title X, Part A, Section 10103 of the Improving America's Schools Act (P.L. 203-382).

Each year, the Southeast Regional Character Education Conference is held in Chattanooga (<http://www.centerforyouthissues.org/seconf03/seconf03.html>). Last summer a multiplicity of educators from thirty states—administrators, superintendents, counselors, principals, coaches and teachers—convened in the Scenic City of the South to learn about trends, experiments and activities in this area. Some other qualities encompassed in their definition of Character Education not mentioned before are self-discipline, perseverance, cooperation, goal-setting and service to others. Their specific breakout sessions addressed Elementary and Secondary Character Education separately, conflict resolution, bullying prevention, family systems and school-community Character Education integration.

Two other associations with vital influence in this realm are the Center for Youth Issues and STARS. For years, Congressman Zach Wamp has lauded these groups for their meritorious endeavors (<http://www.house.gov.wamp/press/co1010315.html>). The Center for Youth Issues Inc. is a 501 c(3) non-profit that disseminates materials and sponsors programs on character education in more than 26,000 schools, impacting over 10 million students. STARS is an acronym for Students Taking A Right Stand. Members sign commitment cards pledging not to use alcohol or other illegal substances, and also that they will seek help from a Guidance Counselor or other mental health professional if they feel so inclined. Some of their traditionally-sponsored events are Red Ribbon Week and the Teens on the Move Conference. Both of these agencies originated in Chattanooga with the auspices of local and regional benefactors, however their influence now spans the country and popularity is continuously growing.

Student mentorship can yield plentiful benefits in the life of an environmentally disadvantaged and socially deprived student. Even those from supposedly "good homes" receive advantages when paired with exemplary role models. Tennessee has realized this fact and capitalized on it in the educational arena. Counselors serve as liaisons between classmates or between students and community volunteer mentors to form mutually agreeable alliances for both parties. The National Court Reporters Association works with eleven states to assign mentors (mainly high school students to middle schoolers or college students to high schoolers) to public school attendees (2000). A division of this union is The Tennessee Court Reporters Association. They have a Student Mentoring

Committee by which students are linked to mentors. There are specific guidelines, criteria and qualifications that must be met before a person is accepted.

The significance of career counseling is often underestimated. Occupational knowledge and exploration are positively correlated with academic achievement: in other words, as student grades and test scores rise, so does the corresponding interest in job possibilities. Student-to-student mentoring can help direct an adolescent's focus toward enjoyable and practical professions. For instance, in Memphis City Schools the Vocational Education Programs of individual schools contain an apprenticeship element whereby students have a more experienced counterpart to emulate through their licensure/certification or skills-based training programs (2002). Consulting with someone about course of study and prospective employment opportunities alleviates stress and anxiety for many students as they arrive closer to their expected graduation date.

School Counselors in Tennessee lobbied to charter a chapter of the American Society of Interior Designers (ASID) in Tennessee (http://www.asid.org/about_asid/chapter_resources/tn.pdf). This effort bolstered support of vocational education programming and elicited favorable publicity from state legislators and bureaucrats. Vocational Education was in danger of virtual elimination in the state only a couple of years ago, until this addition.

The organization's by-laws namely delineate their mission statement, purpose, implementation and projected outcomes. As with nearly any other firmly established mentoring program, they want to "foster a mutual exchange of knowledge and skills, inspire reciprocal development and set a foundation for life-long learning." Academic and social matters are discussed within the organization to better the learning process for the students. Access to mentors is easily attained and there is flexibility within the Student Representative Board. State Chapter Affiliates are in Chattanooga, Memphis, Nashville, Knoxville and the Tri-Cities.

What accounts for the high percentage of student involvement in a voluntary organization? One high school counselor suggests that promotion of the federation centering on student needs and concerns rather than educators' needs is the biggest factor. "Students often feel their issues rank secondary to the adult sector, but in this case we (school counselors) unified and zeroed in on a deficit that was rapidly diminishing into an extinction." Now other trade associations are deciding whether to bring their professions to Tennessee and create more job options for post-secondary graduates. Of course, productive citizens generate abundant revenue and profit in our economy.

Statistics on incidences of violence and substance abuse in Tennessee Public Schools are staggering and disheartening. Several week series on bullying, peer pressure and self-esteem have become more popular in counseling programs over the last few years. Also, school counselors have teamed up with community agencies to combat the prevailing notions that "Might is Right" and drugs are fun.

Quite possibly the greatest challenge for any of our schools in 2004 is how to keep our children safe and drug free. Title IV distributes federal funding to Tennessee Public School Systems and others in need (<http://state.tn.us/education/sp/sp-drugs.html>). Detailed enactments of this broad legislation have previously entailed the Safe Schools Act of 1998, The 21st Century Community Learning Centers Program and The Tennessee School Safety Center. The Safe Schools Act awards grants to schools to

increase school security on their campuses. The 21st Century Community Learning Center offers extended learning opportunities to economically and socially disadvantaged students, encouraging them to reach their highest potential and not become dysfunctional products of their surroundings. The Tennessee School Safety Center trains educators on a wide range of school safety and youth violence prevention issues.

During the course of my two-year counseling career, I have been recruited to join Memphis City Schools Safe and Drug Free Schools Union. I have attended training sessions and drafted an Emergency Evacuation Plan for my school site. I have sponsored a Peace Week with our Student Council Representatives and brought in Guest Speakers from the Metro Gang Unit Task Force as well as Congressman Harold Ford Jr. and other inspirational speakers to tell our children about the repercussions of violent behavior.

Clara Evans, R.N. of Southeast Mental Health Center in Memphis, Tennessee, wrote a grant in 1999 to propitiate an Intensive Focus Prevention Program for at-risk youth. The State of Tennessee awarded her a multi-million allowance to spearhead and supervise this Program. The module is on a ten-year probationary run. Basically, a team of four to five Mental Health Specialists operates this program through Title I Schools in Memphis City. School Counselors are the vessels through which these agency representatives can communicate with the students because the on-site counselors must obtain parental permission for the probable candidates to participate. Very often the success of this program is contingent upon the school counselor's diligence in gathering participants. Once permission packets are in, pre-assessments begin to determine whether this group setting is best for that particular student. Bi-weekly sessions spread out over six weeks (for a total of twelve sessions) touch upon anger management, goal-setting, decision-making, substance abuse knowledge, forming healthy friendships and good study habits, just to name a few. At group termination, they celebrate with a pizza party and present projects on what they have learned in the program.

I used to work with this Program prior to employment with Memphis City Schools and have personally seen them flourish or fail based solely on the counselor's persistence to see it through. Now that I'm on the other side, I welcome the Agency into American Way Middle School to work with our young people because I see the depth of the need and know I can use all the help given in meeting our students where they are and advancing them to a level where they can logically employ other tactics besides violence to solve their conflicts and not resort to drugs to escape their problematic circumstances.

In terms of overall academic progress, Tennessee ranks forty-eighth out of fiftieth on national polls. One reason is because of our poor literacy rates. Over fifty percent read below grade level; seventy percent of the fifty percent are African-American. How are school counselors working to close this humongous gap?

Academic counseling research has shown early childhood is the optimal time to teach basic reading skills. At this stage, neurons are multiplying at an instantaneous rate and children readily absorb information dispensed to them. As they get older, especially if they have not been exposed to an enriched learning atmosphere, they tend to recoil and get further behind. It is imperative to introduce them to the fundamental concepts when their brains are ripe for discovering all that is unknown to them and challenge is invited as opposed to rejected.

The Public Education Foundation's Benwood Initiative has donated over \$7.5

million dollars to improve literacy and attract quality teachers at the elementary school level in Chattanooga. East side Elementary is an inner-city school that has experienced firsthand revolutionary reading program intervention. The ‘baggie book’ program gives reading level books to children who then take them home and read to or with their parents for twenty minutes each weeknight (<http://www.pefchattanooga.org/www/docs/112-23>). Twenty minutes may seem inconsequential in a rare instance, but repeatedly five evenings a week adds up to quality time. Empirical studies on the usefulness of the Program have revealed an average one grade level advance for thirty out of thirty-two students. Clearly children are not only enjoying the activity, but they are uncovering a whole wealth of knowledge that was previously inaccessible to them.

Does early intervention in preventing high illiteracy rates among school age children mean that later efforts are futile? Certainly not. Many school counselors have referred adolescent students and their parents who “slipped through the cracks” to reputable organizations which specialize in teaching basic reading skills. The Tennessee Literacy Coalition and the Memphis Literacy Council are two well-known agencies providing this service (<http://www.literacyconnections.com>).

Teachers complain of low parental involvement and interest in the child’s education, but they cannot value and support what they have not experienced and do not understand. Therefore, to explain that reading is empowerment and inform them of the opportunities to learn for themselves, they can join school counselors and teachers in encouraging and reinforcing reading competencies in the students.

A report published by research analysts of the “Teaching Tennessee’s Kids To Read” Campaign cited a major obstacle in eradicating the cycle of illiteracy are teachers lacking expertise to address the deficiencies (<http://www.comptroller.state.tn.us/orea/reports/read2.pdf>). For example a sixth grade teacher who has a student reading at the first or second grade reading level may not only dislike the idea of reverting to elementary phonics for that child, but simply may not know how to do so effectively because that’s not his or her area of study. In addition to reading specialists, school counselors often have more flexibility and particularly if their big proponents of academic counseling, we want to meet the needs that the teacher cannot. So definitely to lose the accessibility of school counselors could be relinquishing the support structure for strong academic achievement.

Through examples of character education, mentorship, violence and substance abuse prevention and reading literacy I have shown that school counseling services and programs are indispensable resources in our public education system. In fact, given all that we do with such a meager amount of funding appropriation (when itemized within the entire budget), it seems astounding that so much can be accomplished. Granted, there are always more lives that can be touched by the programs and services but they are making a difference for many.

Budget deductions are pending for school counseling programs in several districts. Government officials do not realize they would be better off making other types of adjustments instead of resorting to extinguishing these critical services. They contend that with the presence of school counselors and mental health services there still exists a physically, emotionally and psychologically disturbed youth generation. Imagine how devastating the despair would be without counseling and therapy.

Nation-wide shortages have caused counselors to have massive caseloads often beyond our capacity to handle. In our fast-paced, stress-ridden society today, students often find themselves facing the same personal woes as their parents: identity crises, relationship difficulties, future uncertainties. I believe we cannot and should not attempt to discredit the legitimacy of our children's pain and suffering. We can exhort vociferously that school should be about learning and leave personal matters at home, but that is not how we function as adults. Just as counsel restores us, it can restore them too. Abatement of school counseling services and programs is not just a matter of dollars and cents, but for some students it's destroying their help and their hope.

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Skill building: Using the Concept Map as a Graphic Organizer to Enhance Science Achievement

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Students must build or construct their own knowledge for a particular concept to be personally meaningful (Dobey, D., Biechner, R., and Raimondi, S., 1996). Concepts in science are sometimes complex and many times abstract. These ideas compound the fact that teachers need to create classroom instruction that is conducive to an effective science learning environment. Strategies that promote or advocate this type of environment incorporate a variety of learning activities to involve students. This involvement should be interactive and "hands-on." Interactive activities encourage student participation and ultimately drive the students to obtain a heightened sense of observation according to Dobey, et. al. (1996). Dobey also suggests that the role of the teacher is to act as a guide to place the students into situations that encourage their inquisitive nature (1996).

Howard Gardner's theory of multiple intelligence includes different typed of approaches to learning: linguistic, logical, spatial, interpersonal, intrapersonal, musical,, kinesthetics, and the naturalist (Dobey, et. al., 1996). Incorporating many of these learning styles creates a more diverse learning environment and eventually makes instruction more meaningful and effective. Removing any gaps in these learning styles promotes an open line of communication within the classroom. Assessments utilizing several types of learning styles can include but are not limited to paper/pencil tests. Educators can openly evaluate students according to what they communicate orally as well as in reflective journals.

According to Dobey, et.al (1996), adolescents in middle school are operating at or near the concrete operational stage of Piaget's theory of cognitive development. In this section of their cognitive development, students benefit mostly from activities that encourage organizational and classification systems, such as concept mapping skills which allows the building of relationships based on the students' prior knowledge. More specifically, these are activities that allow students to inquire about more complex classification themes, inclusive of more abstract ideas that require higher level thinking skills.

According to Snowman and Biehler (2000), more meaningful learning occurs when instruction relates unfamiliar concepts to daily activities of individuals. These occurrences solidify an abstract idea when it is associated with daily activities or familiar surroundings. Concrete examples such as maps, graphs, and illustrations facilitate a more meaningful lesson. Learning to differentiate between similar objects allows for self-directed learning or metacognition (Borich, 2000). Borich further states that the teacher should use mental modeling to show students an effective way to reason, make students conscious of the reasoning involved, and focus students on applying the reasoning (2000). Research studies have documented that repetition and memory is enhanced when it is presented in an organized fashion (Snowman and Biehler, 2000). Specifying ideas and identifying relationships accomplishes this objective. Students perform successfully when ideas are presented in a more methodical way (Wong and Wong, 1998). Assigning too much information without organization for the allotted time is a common mistake. According to Reutzler and Cooter (2003), graphic organizers do the following:

Verbalize relationships among concepts by the Graphic organizer

Provide opportunities for students' input and questioning

during modeling and guided practice experiences.
Connect new knowledge to prior experiences.
Develop "need to know" questions that relate to upcoming readings and further research

Being organized in one's thoughts in a classroom does not start when the assignment is given to the student but it should start when the students enter the room. Classroom routines should be included within the classrooms to assure that the students retain the information. Bell work can be a routine and a type of assessment to be sure that students can recall information from hands on activities. The assessments can be oral or written. Using different types of assessments vary the classroom instruction to help meet the many learning styles within the classroom. Some assessments can be oral reports or responses, reflective journals, and students' logs.

To what extent does implementing these strategies (using concept mapping,, journals, bell work) enhance student achievement? Will it really work and when can one begin to notice the changes? This action research project will attempt to contribute to the literature on graphic organizers by answering these questions.

The Study

This study involves eight grade science students in a Memphis area middle school. The objective for the research project was for the eighth grade students in the science classes to use science inquiry during class activities to improve their science comprehension. The following schedule was the outline of strategies integrated into the daily instructions during this six-week study.

Week One

The students began the week taking terms for minerals and types of rocks and attempted to associate them according to texture and color. As the teacher facilitated an environment that required all student participation, the class was divided into groups and words that had been pre-cut were passed out. Each group had a different set of words and their responsibility was to derive a method of classifying them to show some type of arrangement. This activity was to serve as a motivator to introduce concept mapping. Allowing the students to touch and organize the words according to what they think involves all students; and involving students in the learning process is an excellent motivator (Dobey, et. al., 1996). The involvement that occurred encouraged more silent students to participate and more assertive students to delegate. The strengths of many students began to be seen. Dobey, et. al., (1996) and Webb, Metha, and Jordan (2000) encourage the involvement of interactive activities that require cooperative groups. Groups that welcome insight from all participants have an excellent opportunity for more effective learning activities.

The class divided the rocks and minerals words into many classification schemes on the board. The activity was used after the days' bell work was complete. It was allocated only 15 minutes of each class period Monday through Friday. Monday's exercise was a little difficult because it was the introduction. Tuesday through Thursday actually showed much promise as the students used increasing more complex strategies to sort the names of the rocks and minerals. Friday's quiz was a ten-question exam and 65% of the class answered 70-80% of the questions correctly.

Week Two

This week began with the teacher using a blank concept map with ovals for bell work (see figure one). The students' task was to label the ovals using the terms: Sedimentary rocks, clastic, organic, chemical, Rocks, compact-cemented. Placing these terms in a logical sequence will assist the students in the following weeks to identify certain properties of each rock type. Snowman and

Biehler (2000) suggest that students that establish organization skills become better problem solvers. On Tuesday and Wednesday, words were added to the concept map that "made sense" of the logical sequences. The students continued to assist as I created a concept map that modeled to the students a more uniformed method to understanding science vocabulary and concepts.

Orally, many of the eighth graders performed well when questioned at the end of class, although it may have shown their ability to memorize and not learn. The ability to believe that they have learned more than they thought they had proved to be difficult. Improving their overconfidence barrier proved to be somewhat difficult. The science students' ability to memorize what they had seen and heard previously tended to be their most valuable source of learning, versus completing homework assignments.

Unfortunately, the teacher has not created an alternative method of teaching without homework at this time. Students that continued to have difficulties were given flash cards with definitions to be distributed throughout the class to drill and practice with partners when class work was completed. The flashcards will be used as an oral quiz for extra points on the lowest quiz grade.

The ten-question quiz on Friday yielded unfavorable results. Grades of several of the higher performing students did not exceed 60 points while students that were given extra opportunities and attention from the teacher maintained a low score. Several distractions in schedules and class pictures may have been the culprit although the flash cards might have needed supplementary practice sheets to accompany them.

Week Three

The students have progressed through sedimentary rocks and have moved on into metamorphic rocks. This week's focal points will be geared toward that recognition of texture and composition of both types of rocks. The concept mapping had helped the students to understand the importance of organizing ideas and vocabulary within the classroom (see figures 2 and 3).

Comprehension has improved because homework and class work participation has also shown improved accuracy and completion rates. The first two weeks only 18 students completed homework with satisfactory grades (80-90%), and now, with the exception of two lower achieving students, the majority of the class has shown a strong commitment to homework and class work. Class work is counted with the same weight as homework.

Eight students have had problems with understanding the largest idea in a concept map. Modifications included a visual correlation between baking bread in an oven to metamorphic rocks. This correlation helped the students to realize that just like ingredients in a cake was similar to minerals in rocks being baked to form rocks. They also realized that other material could be made to form a more complex cake or bread, similar to the way rocks could form other rocks, such as in the process that forms metamorphic rocks. Observations such as the aforementioned were documented in the students' journals.

The students prepared for the next two weeks by writing explanations to open ended questions. The questions were derived from classroom activities as well as the concept map organizational skills.

Week Four

Students worked in groups to complete a chapter review that covered concepts on sedimentary, metamorphic, and igneous rocks. The students had to compare and contrast the three types of rock. The students were grouped according to ability and were assigned (by a group member) a certain number of problems. The students decided who should answer completion, multiple choice, and matching

test questions. All students, independently, answered short answer questions. The students appeared to have more in-depth answers to short answer questions. Several questions referred to similarities illustrated in the concept maps previously shown within the class.

The test review was preceded by a game similar to "Who wants to be a Millionaire." Students answered questions and were allowed to get help from the entire class, one friend or myself. The questions sometimes called for in-depth explanations. These questions were derived from daily bell work as well as the different graphic organizers presented during instructions.

Much of this week was also devoted to TCAP review and finishing the chapter. The students' vocabulary has improved on individual class work assignments given. The direct reading workbook has been completed mainly as homework. Only five students have shown inconsistency in returning the homework, but have benefited from the organization of ideas during classroom instructions, using results from bell work assignments.

Week 5 and Week 6:

Due to TCAP, state testing, preparation and spring break, this data collection procedure was somewhat hindered. The bulk of the results were most consistent during the first four week-periods. Weekly quizzes were given, although it was mostly fill in the blank. The students appeared to become less focused because of the emphasis on the testing schedule. No new concepts were introduced during the fifth and sixth weeks but several activities were done to reinforce what had been learned. This reinforcement included several puzzles that were mostly comprised of drill and practice situations, only taken for a class work grade. The students were required to write any comments and concerns in journals to create more teacher-student interactions.

Data Collection

The research collected and documented within the action research project proved offer several strategies to assist with classroom instruction. Documentation of the action research consisted of various strategies incorporated into the classroom instructions and reflections as to how the project was progressing. During the six week periods, the teacher /researcher used several sources to guide his actions within the classroom including reflective journals, graphic organizers, cooperative groups, and lesson plans.

Reflective Journal (The Students' and The Teacher's)

During the third week of observations students recorded any observations and comments in journals. The journals vary the assessments within the classroom. Students are able to ask questions in the journal that they did not want to ask verbally. This allows more students to inquire about things that they would not normally ask within a classroom setting.

The research journal was a continuous document that represented my reactions to the interventions utilized within the classroom. It did not offer much assistance as far as growth during the initial three weeks. The comments and observations tended to be frustrations with the small amount of improvements the students displayed. Several of the teacher's comments were not insightful and may have represented limited experience with eighth grade students.

Concept Maps

Organizing information in science is one distinct way to highlight the concepts needed for any particular objective. Concept maps were utilized to create a systematic way of showing

relationships to vocabulary terms within the classroom. Students helped to create different maps in the classroom to help make learning more meaningful. The concept maps were designed to assist the students in retaining vocabulary words from classroom activities. Additional branches were added to the original map daily to increase the effectiveness of the conceptual organizations that were introduced.

Cooperative Groups

The students were placed in groups according to ability. Ability levels were categorized using these ranges: 100-94.5%, 94-89%, 88.5-83%, 82.5-77%, 76.5-71% and below 70. Categories with larger numbers were divided within that category to ensure that no particular group had numbers higher than 3 or 4 members. Each member was assigned a role according to the map designed. Roles consisted of designer, recorder, and presenter (s).

Science Journals

Students were asked to keep a spiral notebook to record observations and/or comments during classroom activities. They applied concepts introduced during the mapping activities to their writing. The science journals were graded using an assessment rubric from Holt, Reinhart and Winston (2000). The rubrics were designed to analyze and aid students' ability to write using science concepts.

Lesson Plans

Planning has been the most encouraging component of this project. The goal of the lesson plans was to develop thinking skills and the ability to challenge assumptions, think creatively, and solve real-life problems, while building a solid science vocabulary to gain a strong understanding of key scientific principles and topics.

Analysis and Findings

This section explains how each type of interventions used in this action research -project was used to improve student achievement. The **science journals** were assessed using the rubrics which accompanied the text (Holt, 2000). The writing scores were evaluated bi-weekly to note any improvements. The scores from the student writing showed much improvement from the first day of writing. The written work displayed the students' ability to observe after modeling of the strategy. The science journals illustrated that the students were paying attention, but the concepts were difficult to grasp. The first set of scores on the writing averaged 70-79, which stated that most of the assignments were complete, although it indicated confused thinking about a concept. Graphs were included but were used ineffectively or inadequately. A five-point improvement may have shown the students' ability to grasp the concept of mapping.

The students also were given weekly quizzes that included but not limited to 10 question item assessments with mostly multiple choice and blank concept maps. The quizzes were usually a ten-question exam and 65% of the class answered 70-80% of the questions correctly.

The **concept maps** included 7-10 blanks with a word bank. Students were graded according to the number of completed blanks on the map and received additional points for adding any necessary terms or words to make the branches of the map more sensible.

The first week consisted of introducing the idea of concept maps and concluding from the scores on the weekly quiz, many of the students had a difficult time understanding how to comprehend the maps. They used maps from earlier in the week to answer questions

and the average scores ranged 50-75% with partial credit being given if explanations accompanied any answers.

The **cooperative groups** appeared to have a profound effect on the concept of mapping. Several students in various groups proceeded to model strategies for thinking to their group members. Slavin has concluded that group success leads students to strive for higher achievement, as personal accountability is a major goal of in-group situations (Webb, et. al., 2000). This appeared several times during the six-week period and improved three of the lower performing students' weekly quiz grades by 5 points.

The teacher's relationship with the students proved to build confidence in trusting the instructor, because several of the pupils have yielded positive comments. These comments have manifested in greater classroom management. With improved teacher-student interaction, the teacher was able to assist lower performing students while higher-performing students develop more complex ideas within their science journals.

Conclusion

Were the research questions answered? Was the research period an adequate length of time? These are major questions researcher and teacher educators ask when reading a manuscript such as this?

To what extent does implementing these strategies (using concept mapping, journals, bell work) enhance student achievement? This research question was answered for many students' tests scores improved, their concept mapping skills improved, and their discipline improved. This improvement in behavior and increase in achievement over a short period of time does not allow for one to generalize but it does allow for beginning teachers to infer that over an extended time, maybe greater changes and achievement are possible.

Will it really work and when can one begin to notice the changes? This action research began to show changes within four weeks of consistent practice. The students responded quickly and the changes showed in their work and their behavior. These students had positive learning experiences for six weeks, which increased their achievement and grades, which they care about! So, for the sample, which participated in this study, it works! The graphic organizer, concept maps, enhanced the students' work, their retention, and their overall achievement.

Educational action research is a system of inquiry that teachers, administrators, and school support personnel can use to study, change, and improve their work with children and in schools. Through the action research process, educators are able to generate knowledge about their practice and share that knowledge with others. Classroom action research, as was seen in this manuscript has value also even though it is done in only one classroom. It is a form of action research conducted in a classroom and impacts the practice of teachers. It values the interpretation that teachers make based on data collected with their students (Hendricks, 2006). It is this reflective practice which improves many of the classrooms across the nation.

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