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Exploring Experiential Learning

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To utilize a process through which a learner constructs knowledge, skills, and value from direct experience brings relevance to our curriculum. Experiential learning operates under the premise that making discoveries and experimenting with knowledge puts students at the heart of learning through the hands of experience.

Two first year teachers extended their classrooms by creating curriculum that challenged their students to apply prior knowledge, develop new skills, reflect upon these experiences, and contemplate how life is influenced by their thoughts and actions. As each teacher's action research unfolded, it became obvious that using experiential learning provided opportunities for the students to gain a deeper understanding and appreciation for learning.

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Mr. O'Neil looks in the rear view mirror as he pulls the van to a stop at the park ranger's station. He shakes his head and smiles as 14 rambunctious teenagers shout their favorite lyrics and gyrate the van. He wonders how this journey of in-depth discovery and experiential learning will influence his students.

As Mr. Lindgren's 18 pre-algebra students enter the indoor water park, he sees their eyes light up like a kerosene lamp that's just been ignited. As a gentle reminder, Mr. Lindgren asks them to take out their math investigation sheets. For a moment, a student snaps back to reality, "Oh yeah, we're doing math today."

Mr. O'Neil and Mr. Lindgren are novice teachers involved with a graduate induction program that mentors first year teachers as they complete a master's degree. Within their program of study, they take a research course entitled Action Research in which they "gather information about how their particular schools operate, how they teach, and how well their students learn" (Mills, 2007, p. 5). The process of their experiences and the results of their implementation provide insight for teachers to reflectively study their own practice.

Through action research, these two first-year teachers explored the use of experiential learning environments to engage their students in active learning. As middle school teachers, they have come to realize that hands-on learning can be taken to the next level and become more collaborative if we share the responsibility of learning with our students. *This We Believe: Successful Schools for Young Adolescents* (National Middle School Association [NMSA], 2003) refers to this teacher-student collaboration as "hands-joined" (p. 16). Too often school curriculum is

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redundant, fragmented, unrelated, boring, and teacher-centered. This is a far cry from a "curriculum that is relevant, challenging, integrative, and exploratory" as suggested by the National Middle School Association (NMSA, 2010, p. 17). The challenge is for teachers to recognize, embrace, and explore meaningful learning experiences for their students. These two young teachers created active learning environments that require students to connect learning to real-life situations and make it more meaningful (authentic), challenging (higher-order thinking), supportive (structured but flexible), relevant (incorporate real life aspects), and exploratory (i.e., freedom to do).

Engaging Students and Teachers in Active Learning

For far too long, teachers have taken a traditional approach to promoting learning. The dissemination of information by a teacher without regard to how the student learns has put our educational system at risk. When students are placed in a state of educational dormancy, it is worrisome; as unlike wine, a mind left untouched will not ferment into something better. Eric Jensen (1997, p. vi) affirms this by stating, "While the old academic model addressed primarily the intellectual aspects of learning, the prevailing model suggests that we learn with our mind, heart and body. This more holistic view underscores the importance of considering all of the learner's issues."

Historically, researchers have addressed this issue. Goodlad (1984) believed that a majority of teaching still involved the teacher as the dispenser of knowledge and the student as the passive recipient. He supported John Dewey's (1938) views that individuals construct knowledge through direct experience and, thus, learns through action and reflection. Dewey (1915) stated, "Education that associates learning with doing will replace the passive education of imparting the learning of others" (p. 163). More recently, the National Middle School Association (NMSA, 2010 & NMSA, 2005) has taken a strong stance on the premise that intellectual and cognitive development is best promoted through active, engaging learning.

Although the process of moving from passive to active learning has taken time, there are a growing number of teachers who embrace the fundamental ideas of constructivist learning. Taking their students' background knowledge, evaluating how each student learns best, and then having them apply that knowledge through authentic means has revolutionized the learning process. "Students learn best when they apply their knowledge to solve authentic problems, engage in sense-making dialogue with peers, and strive for deep understanding of core ideas rather than recall a laundry list of facts" (Windschitl, 1999, p. 752). When teachers utilize a constructivist approach, new information is added to the students existing schema. "In a good 'constructivist' classroom, the challenge in the change process is to create significantly higher expectations without the crippling anxiety that thwarts risk-taking and learning" (Wagner, 1998, p. 513). We want our young adolescents to "take risks intellectually, socially, and emotionally" (NMSA, 2005, p. 53), but for this to happen our students need to know that their learning environment is supportive and safe.

The premise for these active learning explorations was based on the four distinct elements of the inquiry process (problem, plan, test, reflect). As both

teachers approached their adventure, their methodology included guiding the students through a problem-solving process which involves identifying a problem, developing a plan, testing the plan against reality, and reflecting on the plan (Wurdinger, Haar, Hugg, Bezon, 2007).

Mr. O'Neil, 8th Grade Earth Science Teacher

As Mr. O'Neil progresses through the first half of the school year, he feels that things are moving along. The students are doing well in their science labs and their test scores are a mixed bag, although overall, pretty good. He feels comfortable knowing he is covering his science standards and is confident that he has established good rapport with his students. But he has a yearning need to provide more opportunities for his students.

In Mr. O'Neil's graduate program of study, his spring semester includes an action research course. His initial assignment is to identify an area of focus (e.g., a question or problem within his classroom that he'd like to research). He remembers that his first thought was why he became a science teacher – to allow students to explore their curiosities and learning through doing. He subscribes to the idea that "Young adolescents are by nature intensely inquisitive." (NMSA, 2005, p. 105). With some coaching to narrow his focus and a lot of field notes, Mr. O'Neil decides to investigate how the establishment of a science club would further promote his goal of putting students at the heart of the learning. After getting support from his principal and university professor, he sent out an announcement in the school newsletter, hung flyers around the school, promoted the club in all of his classes, and sent home letters to all eighth grade parents in an effort to generate interest. As he began to review the literature on content area clubs and how they can affect the classroom climate, he began to see how this research could extend to his classroom curriculum and benefit all students in the future. But for now, he was encouraged by his professors to narrow his focus by establishing the "Royal Scientists".

Mr. O'Neil's action research questions (area of focus) were, "What effect will an authentic, scientific-based learning environment have on my students' ability to think critically, apply knowledge, and conduct problem-solving activities?" In addition, he wondered, "How will this experience with a select group of interested individuals transfer to my classroom? In what ways will the science club students' experience influence their classmates understanding and appreciation of the earth science curriculum?"

By February, he has 18 students in his club and they are well along the way of doing exploratory activities every week. These activities reinforce the curriculum that is being taught in his earth science classroom. In time, it also prepared them for the upcoming adventure that was the driving force that motivated the students unlike anything Mr. O'Neil had anticipated.

Early in the fourth-quarter of the school year, Mr. O'Neil introduces to the students in his science club the idea of taking a three-day camping trip toward the end of the school year. He explains that they will be authentically exploring the many science concepts taught within their 8th grade earth science curriculum as well as the extended activities that they were experiencing in the science club. He told them they will be challenged

intellectually, physically, and socially, all vitally important to young adolescents for holistic development.

Mr. O'Neil began planning the trip with his science club and was very excited about how this experiential learning experience could be implemented within his curriculum in the future. Even though he had regrets that this trip could not be done with all of the earth science students, he sees this experience as a stepping-stone to creating a curriculum that extends beyond the four walls of his classroom.

A Three-day Camping Trip

Excitement and anticipation turn into reality as the van pulls away from the school grounds. Mr. O'Neil (and a female chaperone) embark on a weekend (three-day) camping trip with 14 eighth graders involved in the Royal Scientists Club. The expectation is for these young adolescents to utilize the knowledge from their eighth grade earth science class and their extended experience in the science club to apply their knowledge firsthand.

This exploratory adventure comes to a "screeching" halt as the right rear tire blows and Mr. O'Neil must choose between abandoning the ship and using this opportunity for a "teachable moment." "How many of you have every changed a tire?" asked Mr. O'Neil. The blank stares give it away. "All right then, this is a perfect time to learn." The students are asked to handle this situation responsibly, reminding them of the importance of safety as well as to resolve the problem – to fix the flat tire. This becomes an excellent, but unexpected aspect of the trip that further enhances the goal of active learning.

As they arrive at the state park, the students are expected to use a solid repertoire of skills and knowledge to "survive the weekend." Mr. O'Neil starts the camping adventure with direct introduction on how to safely use camping equipment (e.g., axe, knife, matches) and expresses to the students that those tools will only be used with adult supervision. Before he can even finish the statement, "Okay, let's unload the . . . ", the students make a mad dash to the van and truck. Mr. O'Neil chuckles as he recollects, "They don't move that quickly inside my classroom." The students bring tents, sleeping bags, coolers (food and water), cooking utensils, grate, firewood, matches, axe, knife, fishing line, cane poles, duct tape, and first aid kit to the campsite. Mr. O'Neil hands out the instruction sheets to guide the exploration; the adventure begins.

Day One:
Camp Set-Up

Upon finding their site, the first challenge for the students is to set-up camp. During this activity, Mr. O'Neil observes the interactions between the students and their ability to work together in a relatively unstructured environment. The group that erects their tent first, according to the directions, will win the contest. The activity is designed to check their ability to work collaboratively while using sequencing skills (reading instructions); in addition, it increases the overall excitement toward the weekend. At the conclusion of the contest, students are given instruction on how to properly build a fire. The students later recognize the importance of this, as the fire will be used for cooking, light, and warmth.

Stream Analysis Hike

The next activity is a stream analysis hike that was designed to apply the students' prior knowledge. During the school year, the students studied concepts

of abrasion, erosion, deposition, meandering, current, and stream behavior. Through the year, Mr. O'Neil taught his students about the steps of scientific methods. But the idea of honing one's observational skills, collecting data, interpreting those data, and then communicating the results took on new meaning as the student hiked along the Turtle River. The students recorded their findings and make notes about unique features that caught their eyes. Their documentation would later be used to assist with the next activity where knowledge of previously mentioned science concepts (e.g., stream behavior) would predict their level of success.

Rod Preparation/Fishing Contest

Later in the day, the excitement heightens as Mr. O'Neil brings out cane poles, fishing line, weights, bobbers, and duct tape. With step-by-step instructions, each student begins to create their fishing rods. They learn how to secure the line to the pole and how (and where) to tie on the weight and place the bobber. A notch was cut into the pole prior to the activity (so no knives were needed) and upon completion, Mr. O'Neil secured the hook after specific instruction is given regarding the use (e.g., no casting) of the fishing rod.

This activity not only prepares the students for the upcoming fishing tournament, but is also an opportunity for them to utilize their previously collected data (stream analysis), their spatial intelligence, and it challenges them to follow intricate instructions. This fishing contest exposes the students to fundamental science concepts that can be useful in daily life. Through scaffolding, this contest complements the stream analysis hike. The students use their knowledge of stream behavior and habitat needs of trout to make educated decisions as to where to effectively apply their fishing efforts during the contest. This is a catch and release fishing contest because of the location (state park), although several of the students told fireside stories about how to fillet a fish. The biggest complaint for the weekend was that the students ate campfire hot dogs instead of fire-grilled trout.

Day Two:

The second day of this inquiry-based field trip starts early as the students awaken to find that it is their responsibility to cook breakfast. One young man exclaims, "Hey, how do we cook without a grill?" Mr. O'Neil responds, "Stoke up the fire, grab the grate, get the flat grill, and bring on the bacon and eggs." Astonished, the students begin the process of cooking which many of them had not done before. Teaching the students how to regulate the fire and adjust the height of the grate provides Mr. O'Neil with another teachable moment. After breakfast, but before introducing the next activity, the students had to clean the dishes, secure the fire, straighten up their tents (sleeping bags), and pick up the campsite. The first adventure for the day is to walk to the Environmental Center (warming house for sledding or cross country skiers, instructional area for Eco Camp, gathering area for park visitors). Since the park didn't charge for the students to camp, the Royal Scientists spent the morning cleaning up the three acres of land around the Environmental Center. After a sandwich lunch, the students attentively listen as Mr. O'Neil preps them for the afternoon events.

Gully Exploration Hike

The gully exploration hike was implemented to utilize the massive gully system located at the park as an excellent

working model of the process of science inquiry. Once again, students would take information learned in the classroom and apply it to real world experiences. In this activity, students are presented with a scenario. It is their job to derive an explanation regarding how the gully system was initially formed, what accented its growth, and what could stop the continued growth of this hazard. It became obvious that the power of water and gravity cannot be experienced through images in a textbook nearly as effectively as trudging through the carved out ravine. The students climb through the pre-designated (to assure the students' safety) topography of the gully, exploring through hands-on immersion in an attempt to grasp nature's power. During this activity the students use investigative reasoning and prior knowledge to recreate and explore the gully system. Again, the scientific methods of identifying a problem, observing their surroundings, collecting data, analyzing the data, designing a plan, and preparing to share their findings (reflect) at the campfire chat is an assignment the students readily approach.

Campfire Chats

At the conclusion of each evening, the students and Mr. O'Neil reflect on their learning experiences at the campfire chats. They discuss the science concepts that they experienced (standards-based) and think about what knowledge transfers to their daily lives. It is critical that young adolescents actively participate in their learning and think about the learning task at hand (NMSA, 2005). In addition, students are given time to journal and pose questions to solidify abstract concepts. In active learning, students must take the time to focus on learning targets and receive feedback that allows them to make decisions that will move them toward their intended goals. "The teacher's goal becomes teaching students how to monitor and control their own learning" (NMSA, 2005, p. 60). Experiential learning requires critical reflection whereas,

> The students are actively engaging in an experience that will have real consequences. Students make discoveries and experiment with knowledge themselves instead of hearing or reading about the experiences of others. Students also reflect on their experiences, thus developing new skills, new attitudes, and new theories or ways of thinking. (Stevens & Richards, 1992, p. 1)

Day 3:

The students wake up early to prepare their last meal prior to heading home. They joke and laugh about the various stories and mishaps that happened. Without being told, they clean up the dishes by heating up the water over the extinguishing fire. Several head for their tents to roll up their sleeping bags and pack up their belongings. Mr. O'Neil instructs them as to how to fold their tents so they fit in the bags. A sweep of the campsite finds the left over cane poles. One students remarks, "That was so cool. I've never fished before. Now I know how to take a fish off the hook." The stories continue as they loaded up the supplies in the truck. Sadly, the students board the van, but the excitement of the weekend still reverberates for days to come.

Before leaving the park, Mr. O'Neil collects the students' journals. He knows that his work is just beginning. He states,

> I walked away that Sunday morning with a greater understanding and appreciation of three things:
> 1) the classroom and the outside world are two entirely different settings for learning,

2) the value of an educational experience in a setting outside of school is tenfold, and
3) standards can best be taught through a curriculum that is truly relevant, challenging, integrative and exploratory (unpublished scholarly work).

Action Research in Action

Student journals, observation notes, situational (informal) interviews, other artifacts, and the North Dakota K-12 (5-8 specifically) Science Standards, were used to determine if Mr. O'Neil's research questions were answered. To address these questions, he identified three themes that emerged from the analysis of the data:
1. Students displayed the ability to utilize a scientific approach to problem-solve;
2. Students were able to critically think by applying prior knowledge within an authentic learning environment;
3. Students were intrinsically motivated as they engaged in scientific inquiry.

Based on the themes, the following action plans are briefly described to explain the changes made to his science curriculum:

• Continue to restructure the curriculum to incorporate opportunities that place the students at the center of an authentic, experiential learning environment. Examples include: 1. To write a grant to fund the transition (student-led) of our school courtyard into a natural habitat setting; 2) Design curriculum that allows students to experience the state standards through active learning (e.g., construct miniature landforms that will allow students to witness the systems form and function); 3) Pursue the possibility, with the administration and his middle school team, of conducting a year-end camping trip that would involve all the students on the team (i.e., fundraising, safety instruction, scientific methods, permission forms, arrangements, chaperones, securing equipment, etc.).

• Design case studies regarding the data collected from the students' artifacts. These would be used to prepare the students for their experiential learning adventure.

Making Mathematics Real

"Now take out your book and turn to page 35. I'll do a sample problem on the board and then you can get started; problems 1-25 are due tomorrow." Most of us have experienced this less than riveting math class. Even though this passive approach to learning math concepts hasn't proven to be successful for most middle school students, it is prevalent.

Some teachers assume that middle school students are ready for extended lectures when new material is presented. Students continually complain about lectures being overused, non-engaging, and boring; and cognitive science supports that perception (NMSA, 2005, p. 56).

It isn't surprising that students often ask the question, "Why do I have to know this?" This lack of ability to transfer learning to real life applications tends to take away the students' responsibility for learning the process of "collecting, evaluating, and analyzing information to build concepts and understanding" (NMSA, 2005, p. 57). A conscious effort must be made by teachers to incorporate critical thinking skills into their curriculum.

Mr. Lindgren, 7th Grade Math Teacher

Mr. Lindgren has a knack for knowing how to challenge his 7th grade students, but he wants to try something

unique with his pre-algebra class. Considering the importance of a curriculum that is relevant, challenging, integrative, and exploratory, he expresses to his students that math is everywhere. To prove his point, he tells this group of high achieving students that they may study math concepts on a field trip of their choice (within reason), so he surveys the 13 students in his pre-algebra class to see where they would like to "experience math." Hands down the students choose to go to an indoor water park that is located approximately 50 minutes from the school. Mr. Lindgren has the students research the cost of the trip (transportation, entry fee, food) and then brainstorm means of earning enough money to make the field trip a possibility. The students decide upon popcorn and juice sales (at after-school events) and individual earning adventures (e.g., baby-sitting, cleaning the house, shoveling sidewalks, etc.). Through fund raising (budgeting), planning (calculations), and application, Mr. Lindgren had started the process of active learning with his students. "Mathematical tasks often emerge from a real life context, which enhances student interest and helps students interpret the mathematics embodied in the problem" (Reys, 2007, p. 262).

Experiencing Mathematics

After earning the money needed for the excursion, the day finally comes for the field trip. Upon arriving at the indoor water park, the students are given their math investigations and are challenged to activate their prior knowledge to solve the problems. The following are examples of the investigations they will conduct according to the math concepts being addressed:

1) Numbers and Operations: Understanding and Solving Equations (pre-trip):

• How much money do we need to make as a class?

• How much money will each individual have to raise?

• Write a rule that describes what you are selling or at what rate you are working. Solve your equation showing all work.

2) Linear Relationships (pre-trip):

• Make a graph showing the money you made per minute, per hour, per items sold. Show all appropriate labels and a title.

3) Ratios and Percents:

• Survey people at the park to determine whether they are staying at the hotel or just using the water park. Show a ratio that would describe the number of people staying at the hotel. Then create two separate equivalent ratios in a chart or graph.

4) Rate:

• We estimate the distance around the lazy river to be 250 yards. With a partner, take turns floating around the river and record your time. Find your rate in feet per second.

5) Slope:

• Graph your rate of feet per second for floating down the lazy river. Plot the points and connect the points to make a line for your slope. Explain what slope is.

• Determine the slope of the stairs that lead to the water slide. Develop a hypothesis of your findings.

6) Geometry and Algebra:

• Find the volume of the large water bucket by estimating the height and radius. Show your equations and work. Use appropriate labels.

• The bucket takes seven and one half minutes to fill up before it dumps into the

pool. What would be the amount of water needed to fill the bucket per second in feet cubed?

7) Scale Factor (Measurement):

- Find two similar figures of different sizes and draw them.
- Give the scale factor from one to the next.
- Give the area of the smaller figure and the area of the larger figure.

Returning to the classroom

Upon returning to the classroom, the students complete a weeklong exploration of their calculations and findings. During this time, they enthusiastically discuss what they learned about math and the concepts that they had been studying during the year. One of their assignments was to design a new ride for the water park (including the design sketch, measurements, estimated cost, etc.).

As Mr. Lindgren reflects on the experience, he states, "From my observations, the students had better attitudes, increased motivation, better communication, more positive relationships, and positive comments regarding math and how it relates to their world" (unpublished scholarly work). During Mr. Lindgren's graduate portfolio, he expressed how this experiential learning experience addressed all the mathematic standards and did so by engaging his students to do their own learning. "Students learn most powerfully from doing, not just hearing about a subject" (Zemelman, Daniels, & Hyde, 1998, p. 8).

Mr. Lindgren's Research Questions and Ensuing Action Plan

Mr. Lindgren's research questions are:

1. How are students able to transfer learning to real life, problem-solving situations?;
2. What occurs when students are responsible for learning the process of collecting, evaluating, and analyzing information to build concepts and understanding?

From his findings (student data and self-reflection), he constructed an action plan that included:

1. A proposal that an experiential learning adventure would be expanded into a team-wide interdisciplinary/ thematic approach (four core content areas) conducted throughout the school year (addressing thematic concepts and conducting fundraising). The unit would conclude with a culminating field trip that allows student to demonstrate their knowledge and understanding;
2. To continue to redesign his curriculum to bring math alive within his classroom. For example, to incorporate hands-on activities that address the math concepts covered (e.g., measuring the slope of various stairs and hypothesizing the reason for the results).

Extending the Classroom Successfully: Experiential Learning

Mr. O'Neil and Mr. Lindgren's goals were to teach students *how* to think rather than *what* to think. Both teachers devised a curricular plan that moved the focus from answer-driven to inquiry-based. The biggest obstacle that they faced was the limiting, and oftentimes, controlled traditional school structure. An in-depth inquiry that promotes active learning doesn't occur in a 48-minute time block, so extending these experiences outside of the classroom took on a life of its own.

Many teachers are dabbling with elements of experiential learning, as it begins with our current standards-based

curriculum, our students' interests, and a desire to make the learning active. We encourage teachers to start small by altering curricular projects and activities to involve students directly with the learning targets. Instead of having students learn from their fingertips, let us put them at the heart of the learning experience. We can no longer afford to hold students at the outskirt of the education process. It is time to draw them to the center of the learning environment. Dr. Scott Wurdinger (2005), a leader in experiential learning stated,

> Activities, projects, field-based experiences require students to solve problems and search for solutions, which allows them to be discoverers of knowledge. A project is developed based on an interest, a search begins that includes solving problems that arise, and a process of thinking and doing occurs simultaneously that allows students to discover answers unknown to them (p. 26).

The question isn't so much "if" we should make learning active, but rather "how." How do we engage students in their learning, establish curriculum that is relevant, be responsive to the needs of our young adolescents, and still cover all the content that will be on the standardized test? Wurdinger (2005) states, "If traditional education doesn't begin to use more experiential learning, it will lose its students" (p. 5). So if our students learn to . . . think critically . . . be creative . . . be analytical . . . solve problems . . . process ideas . . . take responsibility . . . apply knowledge . . . work cooperatively . . . be reflective ~ then~ "teaching to the test" for high-stake testing may become obsolete.

The goal is to provide a curriculum that focuses on process rather than product. These two first year teachers, with the knowledge of how to clearly define a problem in their classrooms, developed a plan of action to address the problem, established an evaluation plan based upon their findings, and finally, communicated the results in an effort to improve practice. It is well understood that educational reform is necessary, and that the best place for this to start is in the trenches. So it is a must to provide the practitioners with the knowledge and skills to change the process.

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