Sponsoring Committee: Dr. Richard Grove, Moravian College
Dr. Elizabeth Conard, Moravian College
Mrs. Nancy Smith, Easton Area School District

SELF-DIRECTED LEARNING:

CREATING A CLASSROOM OF INDEPENDENT LEARNERS

AND CRITICAL THINKERS

Lisa Anne Simon

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ABSTRACT

As a teacher of the gifted, providing the best learning opportunities for my students is my main concern. It is my job to introduce my students to and help them develop the foundational skills that will support them throughout their educational careers and beyond. With this in mind, I set out to discover what the observed behaviors and reported experiences would be, for my third and fourth grade gifted students, when I implemented self-directed learning and what effects it would have on their critical thinking abilities. I decided to focus on critical thinking because it represents an important and desirable set of skills. I wanted to know if it could be enhanced or improved in any way. I had previously stumbled upon Malcolm Knowles' work with self-directed learning and read about the success he had had with adult learners. I decided to implement self-directed learning in my own classroom.

I introduced a student-directed research project that followed the Independent Study Model (ISM). The students self-selected a research topic, developed focus questions, collected and organized pertinent information, and chose and developed an appropriate research product to demonstrate the knowledge gained. I provided support, but did not involve myself directly in the day-to-day routine of the classroom. The entire thrust of this study was based on the *students'* abilities to plan, implement, problem-solve, and produce. For me, the finished products were exceptional in variety and quality. On-task behavior

was frequent and the level of investment was high throughout the research process and development of products. Critical thinking ability was determined through a variety of assessments, including the Test of Critical Thinking (TCT), and a variety of reflective writing assignments. There were significant gains for several students from pre- to post-assessment using the TCT. However, I believe the most salient data could be derived from the writing the students did and the thoroughness and thoughtfulness with which they prepared their products.

ACKNOWLEDGEMENTS

I would like to thank my husband for overwhelming me with his insight that I had so much more to offer and shoving me out the front door to do it. I would like to thank my children for giving up quantity, allowing for quality, and just being there at the end of the day. I would like to thank the countless friends and colleagues who listened to me rant, vacillate, and at times blather about my position and all that it entails.

But most of all, I would like to thank Dorothy Gale for leading the way.

I am Dorothy. I embarked on a magical expedition to escape the ordinary, the unadorned, the boring. I sought bigger things, better things – the most colorful things. I left my home and had an adventure. I searched. But what I came to realize was that... I didn't need to look any further than my very own backyard.

"There's no place like home."

"There's no place like home."

"There's no place like home."

This study is dedicated to all of the Dorothys out there.

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RESEARCHER STANCE

"The object of education is to prepare the young to educate themselves throughout their lives." - Robert M. Hutchins

The Greatest Job I Never Knew I Always Wanted

"It was the best of times, it was the worst of times..." I was a long-term substitute in second grade. About two months into my placement, I sat awestruck as the principal offered me a contracted teaching position for the following school year. Complete joy! I could remain in second grade and continue to build on my program. I was on top of the world. But just a few months later, I sat dumfounded as the principal informed me that "things" had changed and the position she offered me was no longer available. The reality of education and how fickle it can be was now my only reality.

I thought I would never recover from the blow to my professional ego. However, good fortune intervened, and just days later I was offered the Gifted Support Specialist position I now hold. A window had been opened.

So, How Did I Get Here?

I spent the better part of my first year just trying to get my bearings. I was totally overwhelmed with all that I had to learn, but I did whatever I could to ensure that I would become the best Gifted Support Teacher I could be. I worked tirelessly to provide thoughtful and appropriate gifted services. Things settled down during my second year and I *settled* into the position. I devoured

research – reading articles and books. I attended conferences and seminars. I discussed gifted education with my department colleagues and a number of regular education teachers – anyone who would listen. I was determined to ascertain best practices for working with gifted students. My third year was a blur. I devoted most of my efforts to writing more effective Gifted Individualized Education Plans (GIEPs). And one day, I stumbled across Self-Directed Learning (SDL). I was fascinated with the idea and confident that it could offer numerous benefits to my students. The more I learned about it, the more convinced I was that I had discovered something revolutionary – something that would transform my teaching environment and alter the way my students would think and perform. I was now in my fourth year as a Gifted Support Specialist. I had learned much, but what stood out most was that gifted students were a lot like other students in that they needed to be excited about learning. However, they also needed to be constantly challenged. And I did the best that I could to excite and challenge them about learning each and every day.

No Really, How Did I Get *Here*?

Why Self-Directed Learning? I thought about it for a time and what I realized was that everything I'd been doing the past three years involved self-direction. Reading articles and books, attending conferences, attempting to discern best practices when working with gifted students… It was all about self-direction, my own self-direction. No one told me what to do when I arrived in

my district; there was no guidebook to follow. I designed my program. I had no background in gifted education, so what I developed was based on the knowledge I sought independently. I determined and worked toward professional goals and objectives utilizing all of the resources available to me. I evaluated myself based on how I performed when I delivered lessons and units, and reflected on the impact of my teaching on my students. I grew as a teacher, and my lessons became tighter. Likewise, my GIEPs started to have richer language and more meaningful student goals and learning objectives. I became conscious of the fact that my increased ability and growth was due to my own participation in SDL. This knowledge energized me and reinforced my interest in SDL. Could my students experience the same type of growth – the development of independence and passion for learning that I did?

If only.

I Know I Heard Voices

I heard several distinct voices along the way, but the one that spoke loudest belonged to Maurice Gibbons. He told me the honest truth. The fact that he called the move to SDL part of a paradigm shift was not lost on me. I saw it that way, too. Gibbons (2004) was interested in SDL for many years and noted "an interesting accumulation of support for self-directed learning" (p. 2). In fact, he proposed the idea of students pursuing activities that were relevant to their own personal experiences, using their learning strengths and styles, in an effort

to make the learning more meaningful and fulfilling (p. 2). Yes, yes…keep talking. Malcom Knowles spoke sweetly, cooing and whispering – promising me the moon. He set out to define the manner in which adults approached learning; although he was able to comprehend that SDL could be an effective tool for learners of all ages. He realized that education was evolving and that it *had* to, "It is no longer realistic to define the purpose of education as transmitting what is known…the main purpose of education must now be to develop the skills of inquiry" (Knowles, 1975, p. 15). And then there was Dewey – ah Dewey, the father of modern American education. Dewey was my conscience, sitting on my shoulder. He told me to be careful, to keep the learning relevant and meaningful, to give it purpose for those who would be doing the learning. "Responsibility for selecting objective conditions carries with it, then, the responsibility for understanding the needs and capacities of the individuals who are learning at a given time" (Dewey, 1997, p. 46). The responsibility for educating is not solely the educator's, but also the student's. I took this responsibility most seriously and I expected more from my students because of it. I expected them to make better choices in my classroom, to take risks with their learning, and to do more than "enough."

So, there I was. I *was* Dorothy. I embarked on a magical expedition to escape the ordinary, the unadorned, the boring. I sought bigger things, better things – the most colorful things. I left my *home* and had an adventure. I

searched. And what I found was Self-Directed Learning – the thing that I'd been "doing" for the past three years, the thing that inspired me to read articles and books, the thing that prompted me to attend conferences and seminars, the thing that lead me to ask questions about best practices…SDL was the thing that would increase critical thinking ability in my students.

And, I didn't need to look any further than my very own backyard.

There *was* no place like home.

RESEARCH DESIGN AND METHODLOGY

"The goal is to transform data into information, and information into insight." - Carly Fiorina

How Would I Know If It Worked?

When I was halfway through my research and I had to think about exactly what the data were telling me, I began to worry. I had to absorb all of that information and consider whether or not it appeared as though my implementation of Self-Directed Learning (SDL) skills had made a significant impact on my students. Were their critical thinking skills heightened or improved in any way? Thus I began the task of attempting to answer my research question, "What were the observed experiences and measurable outcomes for my gifted students when self-directed learning skills were implemented and what impact would these skills have on critical thinking ability?" And this type of research question required a great amount of data appraisal and personal and professional reflection. I had experienced the effects of SDL on myself. But was it going to have as powerful an effect on my students?

Participants

My third and fourth grade gifted students at Tracy Elementary were from a generally high socioeconomic level. I had eight third grade students – two male and six female – and four female, fourth grade students. Most of their parents were professionals, who were involved in and concerned about the

education of their son or daughter. And, as I was a case manager as well as an educator, I had had the opportunity to sit down and connect with all of my students' parents at various conferences and Gifted Individualized Educational Plan (GIEP) meetings. A student identified as gifted has met certain criteria:

> *"Outstanding intellectual and creative ability, the development of which requires specially designed programs or support services, or both, not ordinarily provided in the regular education program. This term includes a person who has an IQ of 130 or higher and when multiple criteria as set forth in Department Guidelines indicate gifted ability. Determination of gifted ability will not be based on IQ score alone. A person with an IQ score lower than 130 may be admitted to gifted programs when other educational criteria in the profile of the person strongly indicate gifted ability. Determination of mentally gifted shall include an assessment by a certified school psychologist." 22 Pa. Code §16.21(d).*

The gifted students were a wonderful group of children to work with and they got along very well – they meshed. There had never been an issue with student relationships and I had never had to think twice about pairing or grouping students within my classroom. They arrived at my room excited and ready to work. There was nothing I could not ask of them; there was nothing

they were not willing to attempt. But, what I needed was for them to maintain this fearless attitude and entertain the possibilities that SDL could offer.

Delimitations

Throughout the process I'd been plagued with several nagging questions: How would I know if what I had done – introduced my students to SDL skills – was what made the difference and enhanced their critical thinking ability? I was thrilled when I found the Test of Critical Thinking (TCT) developed by researchers at the College of William and Mary's Center for Gifted Education, to determine critical thinking ability. Surely, this would give me a definitive answer! The test consisted of ten short stories/scenarios, which were immediately followed by a series of multiple-choice questions. The questions were developed to require the use of critical thinking. I utilized the test as both a pre-and post-assessment screening tool. But, would it alone be enough to demonstrate gains? Or were writing samples a better determiner for critical thinking ability? Also related to the TCT, I considered whether or not the specific wording of the questions – offering choices of most likely and least likely – led the students to respond a certain way, ultimately determining how they performed. What if the results did not demonstrate that there was an increase in critical thinking ability?

Then there was the fact that I only met with my students for approximately two hours per week. This also left me wondering about how valid

the results would be – they spent many more hours in the regular education classroom. To me, there seemed to be no real way to absolutely connect a potential increase in the scores on the TCT with the fact that they participated in self-directed learning while in my classroom. This was a major concern for me. While it seemed to be the easiest way to measure critical thinking ability, I became aware that it might not prove to be the best way to determine critical thinking ability. I decided the writing samples I collected might be a better way to assess their critical thinking.

Additionally, with tests/assessments there was a confidence interval to consider – any student could perform within a given range on any day, based on a number of factors. The increase or decrease in scores could have simply been part of the confidence interval. There was one other aspect I did not consider prior to the implementation of my research…that was the fact that students, who are identified as gifted, tend to have stronger or more fully developed levels of critical thinking ability in place. This could easily have skewed the performance levels from the start. And finally, there was the fact that this study took place over the course of three months. Was that *really* enough time to show significant gains in critical thinking ability?

I also understood that there were data I had collected that would not demonstrate the outcome I was seeking. However, what I realized was that these data could be equally important because it would impel me to ask different types

of questions regarding why it was dissimilar, perhaps leading me to new discoveries. I was slowly coming to the realization that being a researcher meant keeping one's mind wide open to the possibilities all the time.

Trustworthiness

I had gathered all sorts of information and used a variety of tools or multiple sources. I had the Student Learning Needs Assessment (see Appendix E) that I administered early on in my research, to inform me about the environment my students preferred to work in – how they learned best. I had the TCT, which represented my pre- and post-implementation information and was a way for me to gauge any increases in critical thinking ability. I had journaling and writing samples, and critical and personal reflections about the research process, which provided me with an in depth look at my students' thinking. And of course, I had their finished research products developed thoughtfully to demonstrate the knowledge they had gained, which would be assessed using the Research Project/Presentation Rubric (see Appendix F). Additionally, I am a person who learns best from engaging in discussion. Early on I began to confer with my colleagues and my principal about how I planned to shape my instruction/facilitation. I also used respondent validation – conferencing with my students to ensure that I was interpreting their work, responses, intentions...etc., appropriately.

My data journey persisted over several months, allowing for extended observation time, which provided me with plenty of data. I was hopeful that this would enable me to make an accurate determination of the effects of SDL. I recorded all of my observations in my double-entry journal, providing as much detail as I could. I wanted to paint a more accurate picture when I was recalling my experience. It was also the place to write my reflections about what I experienced and felt during my observations, as well as considering what my students said and did. I knew there were a number of other variables in place during the time I was performing my research. I now understood that because I had followed a prescribed path, and used the collection tools available, I could answer the questions I asked as honestly and as expertly as possible.

And so, I was anxious to share my story and what I discovered. I was anxious to share it with anyone who was interested in SDL and increasing critical thinking ability, anyone who was interested in working with gifted students and providing appropriate services or anyone who was interested in creating independent learners and thinkers in any classroom environment.

LITERATURE ESSAY ON SELF-DIRECTED LEARNING

"More important than the curriculum is the question of the methods of teaching and the spirit in which the teaching is given." - Bertrand Russell

My Methods and Spirit

My work with gifted students was both a challenge and a pleasure. I was continually seeking effective ways to excite my students about the world and prepare them for their eventual place in it. I spent a great deal of time reading articles and books regarding best practices for the work I did with gifted students. Sousa (2003) described a gifted individual as one who demonstrated, "…an exceptionally high level of performance in one or more areas of human endeavor" (p. 2). These were *my* students. I attempted to learn more about them – about, "…the idiosyncrasies of gifted children and the implications for parenting and teaching them" (Sousa, 2003, p. 3). Thus it was imperative that I strived to discover who my students were and what skills were most important in their development. I needed to create a climate conducive to developing independent skills and determine the most appropriate methods for assessing their ability and growth. Self-Directed Learning (SDL) seemed to cut a path that led to the development of independent skills.

Independent skills meant allowing my students to make decisions and have more input in their own learning outcomes. Much earlier on, Dewey (1938, 1997) spoke of "…the importance of the participation of the learner in the

formation of the purposes which direct his activities in the learning process" (p. 67). And so it became *my* job to provide support and facilitate this type of learning situation – one built on the principles of self-direction and learner directed experiences.

Dewey's Methods and Spirit

I turned to Dewey. If anyone could point me in the right direction surely it was he. He believed in the principle of learning by doing – acting on our environment and learning through our environment. He reasoned providing real, facilitated experiences would allow children to eventually contribute to our society. However, he was quick to point out in Experience and Education, "The belief that all genuine education comes about through experience does not mean that all experiences are genuinely or equally educative" (p. 25). For Dewey, the experience was both "…the means and goal of education" ([p. 89). The educator's role was to help the learner connect the new learning presented to his own existing experience, thus creating new experiences. It had taken on new phrasing more recently as connecting new knowledge to prior knowledge, but still carried the same implication – learner directed. Yet he cautioned that learning was more than facilitating a string of new experiences, it also hinged on "…the presence of difficulty to be overcome by the exercise of intelligence" (p. 79). Again, this idea evolved and transformed more recently into the concept of zone of proximal development. While his ideas were deemed *progressive* to those who followed

"…the line of least resistance provided by old intellectual habit" (p. 30), we seemed to be reaping the benefits of his progress. Dewey deemed that following that line created a person who was "…arrested on a low plane of development" (p.38). And this low plane of development meant a limited capacity for growth later in life. This was a rallying call for change; we had to bring to an end teacher- and other-directed learning. Instead the focus had to shift to self-directed learning.

Knowles' Methods and Spirit

Malcolm Knowles (1975), considered to be the "father" of Self-Directed Learning (SDL) and andragogy (strategies involved with adult learning), heard that call and took up the task. He first defined SDL as,

> "…a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating their learning" (p. 18).

His work set the stage for a large amount of future research. It was instrumental in the educational shift that moved educators away from teacher-directed learning toward enabling students to learn on their own with facilitation. And while his research and teaching were mainly concerned with adult learning, Knowles' findings had tremendous implications for working with young learners as well. Knowles (1975) described the task of education as this: "When a person

leaves schooling he or she must not only have a foundation of knowledge acquired in the course of learning to inquire, but more importantly, also have the ability to go on acquiring new knowledge easily and skillfully the rest of his or her life" (p. 15). This was my goal for my gifted students: to inspire them to continue acquiring knowledge. He helped to shape the evolving job market at the time creating adult learners, who could mold themselves to fit new positions and face different challenges. It was about developing life-long learners. Life-long learning coincided with our ability to transition into our chosen career and perhaps later reform and transition into another career or careers.

However, years later the concern remained that we still didn't "…yet know how to teach self-direction, collaboration, creativity, and innovation the way we know how to teach long division" (Rotherham & Willingham, 2009). These activities: self-direction, collaboration, creativity and innovation represented higher-level skills related to critical thinking. Yet while the teaching of basic skills had been rather constant over the years, the scores related to tasks measuring higher-level thinking had been on the decline (Routmann, 1996). This was upsetting because Rotherham and Willingham deemed that higher-level thinking or critical thinking was one of the 21st Century Skills deemed necessary in achieving success. In fact according to Rotherman and Willingham, one's success was somewhat dependent upon possessing these types of skills.

Marzano's (et al) Methods and Spirit

If we were going to facilitate the development of these skills, meaning part of the goal of education was to establish a path of life-long learning with an emphasis on generating self-directed skills that would enable an individual to continue to grow and learn; we needed a way to assess all of the skills. The work of Marzano, Pickering and McTighe (1993) was also important in the development of SDL. Marzano, et al., defined life-long learning standards as those that "…deal with knowledge and skills that cut across all disciplines and are applicable to life outside the classroom" (p. 15). In their book the authors reviewed *What Work Requires of Schools*, a 1991 report from the Department of Labor, which outlined both "…the academic and nonacademic competencies as necessary for the modern workplace, including: creative thinking, decision making, problem solving, learning how to learn, collaboration, and self-management" (p. 9). These were all vital skills and the authors even alluded to Dewey's original precept of experience. However, they were also just as quick to specify, "Learning through experience is okay only if all students and workers are exposed to the right experiences" (1991, Implications for Learning, p. 16).

Marzano, et al (1993), discussed the need for significant change in educational assessment, "Educators, legislators, business leaders, and parents recognize that educational goals should reach far beyond the scope of traditional subject area domains" (p. 9). The idea was to develop performance-based

assessments "…any and all assessments that differ from the multiple choice, timed, one-shot approaches that characterize most standardized and many classroom assessments" and authentic assessments that allowed students to "apply knowledge and skills in the same way they are used in the 'real world' outside of school" (p. 13). These assessments would be designed to appropriately measure students' authentic abilities based on the *Dimensions of Learning* framework and what were perceived as the standards related to life-long learning. But how did these assessments relate to gifted students?

Sousa (2003) reported the findings of a study, which determined that assessment procedures closely matched to a gifted student's learning and thinking styles enabled him to perform better. Likewise Rotherham & Willingham (2009) asserted, "We need new assessments that can accurately measure richer learning and more complex tasks" (p. 2). This concept of teaching to learning strengths is embedded in Marzano's framework. The framework included five aspects of thinking that were present in all effectively structured learning situations.

1. Dimension 1: Positive attitudes and perceptions about learning,
2. Dimension 2: Thinking needed to acquire and integrate new knowledge,
3. Dimension 3: Thinking needed to extend and refine knowledge,
4. Dimension 4: Thinking needed to use knowledge meaningfully,
5. Dimension 5: Use of effective habits of mind (Marzano, et al., 1993, p.

24).

Within the realm of *habits of mind*, three main categories were identified: Self-regulation, critical thinking and creative thinking.

Marzano, et al., further developed and defined these categories by generating standards. For self-regulation the following would be true of a student: "Is aware of own thinking, Makes effective plans, Is aware of and uses necessary resources, Is sensitive to feedback, Evaluates the effectiveness of own actions" (p. 23). And for critical thinking the student will meet the following criteria: "Is accurate and seeks accuracy, Is clear and seeks clarity, Is open-minded, Restrains impulsivity, Takes a position when the situation warrants it, Is sensitive to the feelings and knowledge of others" (p. 23). Having established, well-defined criteria and appropriate assessments would enable me to evaluate my students thoughtfully, based on my observations and discussions in the classroom. And this was integral in effectively implementing SDL.

The Methods and Spirits of Others: *Putting it all together*

Creating a classroom environment that was conducive to openness and independence, as well as providing differentiation for individualism and learning style was equally important in building an SDL-based classroom. Providing this type of environment involved the "feeling" in the classroom. Lowry (2010) expressed the importance of the classroom atmosphere including a list of guidelines within his paper:

> 1) create an atmosphere of openness and trust to promote better performance, 2) help learners develop positive attitudes and feelings of independence relative to learning, and 3) recognize learner personality types and learning styles.

Knowles (1975) also believed classroom atmosphere to be quintessential, so much so that he opened his book with PART I: THE LEARNER, For the Learner - *Setting a Climate*. Knowles expressed his desire for the classroom climate to be a "warm" one, as well as one generated out of mutual respect, one that included open dialogue, one with clear and specific roles for both teacher and learner, and one that was founded on mutual trust (p. 10).

Silen and Uhlin (2008) also pointed out the significance of responsibility and independence in learning, which were inherent in a learning process that included SDL. Extending this idea to include Song and Hill's (2007) assertion that learners often demonstrated different levels of self-direction in different learning situations indicated to me that when the classroom environment was a positive one students would exhibit more self-directed tendencies. For my purposes, structuring this type of environment meant building a child-centered classroom and focusing on what was most appropriate based on the needs of each individual child. A child-centered classroom meant extending my students' thinking by facilitating the creation of new knowledge and life-long learning in an atmosphere of mutual trust and respect. But it was also my purpose to expose or

“excavate” the knowledge and talents my students already possessed. Garner (2007) asserted that these were part of a child's existing cognitive structures and allowing the child to rely on these strengths personalized the learning and created a climate of child-centeredness (p. 31).

Child-centeredness and personalizing the learning were learner directed and thus self-directed. So what did the research say regarding a child’s existing cognitive structures and learning strengths? In Protheroe’s article, *How Children Learn*, she cited several researchers, who studied active connections to prior knowledge made by the learner with support from the teacher. These connections enabled the learning to be retained better and longer. Likewise, Garner (2007) stated that students came to us already possessing a fairly extensive “experiential database” and as they “grow and learn they continue to expand their experiences” (p. 31) and thus their understanding and ability to make more connections. Even Knowles (1975) believed that a learner's experiences were something that should be exploited by the teacher – utilized as a resource (p. 20). And Gibbons (2004) stated “…research shows that students learn better when new concepts are connected to their personal experiences” (p. 2).

Connecting the research to my classroom, I allowed my students to self-select topics of focus based on their own interests and personal experiences for research, original writing samples and other types of products to demonstrate their learning. By allowing freedom of choice I enabled them to bring their own

experiences to the surface, build upon them and generate new learning connections. Garner (2007) developed the term "metability" to describe this atmosphere of interactive learning, creating and changing ideas based on what was learned. This was a child-centered approach, which through facilitation explored the experiences and knowledge possessed by my gifted students. To me, this was what SDL was all about – providing an environment where the learner created learning with support from the teacher – me.

A child-centered approach also involved "…supporting a child's autonomy, facilitating his or her self-actualization through meaningful classroom experiences, and being able to view situations from a child's perspective" (Grant & Piechowski, 1999, p. 8). And an enrichment program had to include individualized, child-centered curriculum and instruction. In her book Rogers (2002) described the various options for enrichment:

> (1) *exposure* beyond the regular curriculum – to new ideas, skills, and concepts not encountered before; (2) *extension* of the regular curriculum – going more broadly and deeply into the ideas already introduced in that curriculum; and (3) *concept development* – using a concept introduced within the regular curriculum and exploring its meaning and implications fully (p. 103).

"Exposure beyond the curriculum" meant modifications needed to be made *to* curriculum, "These modifications include changes in the content itself; changes in

the products, performances, or expectations for gifted learners; and changes in the ways teachers actually work with gifted learners" (Rogers, 2002, p. 103).

The implementation of an SDL model enabled me to achieve all of these options as well as provide a range of new learning opportunities for my gifted students. In order to accomplish this my role shifted in that I no longer simply presented a set curriculum. I allowed my students to determine and create their own learning opportunities as I guided them and provided support, and I allowed them to evaluate their own performance. That was why SDL seemed like a natural choice for my work with this group of students, who possessed an innate and often acquisitive curiosity. Gibbons (2004) proposed recommendations or guidelines for contemporary classroom teachers:

> "To apply the search for meaning, teachers may be advised to turn course concepts into questions and a collaborative search for answers. Teachers are urged to turn their classrooms into rich environments for learning; to accommodate peripheral perception with posters, concept maps and other adjuncts to their lesson placed around the room, and to involve students by organizing group work and other participatory activities. Teachers are also advised to promote positive attitudes, to encourage students to be aware of their feelings, and to guide students through a process of self-observation to review what they have learned" (p. 3).

While most of the research I located focused on adult learning, I believed the data would support my assertion of a direct connection between SDL and critical thinking. The educational expectation had been set very high. The focus of education was on preparing students to meet the demands of our ever- and rapidly-changing world. For me it was even more imperative, as compared to when Dewey was generating experiences based on experiences; Knowles was developing his self-directed andragogical perspective; and Marzano, Pickering and McTighe were discussing the importance of authentic and meaningful assessments. As an educator I would do whatever I could to prepare my students for continued learning and for a much more rapidly evolving society. In 1970 socialist and futurist, Alvin Toffler coined the term "future shock" in his book bearing the same title. The term evolved from the idea that people would not be able to handle a great amount of change in a shortened period of time. In his book Toffler (1974) discussed the fact that our society was moving from an industrial society to a "super industrial society" and that this shift would leave people feeling overwhelmed and anxious. Toffler (1974) also warned that social problems would arise from information overload, stating that if we did not think about the future, altering our educational approaches to meet its challenges, we would ultimately fail our citizens. Knowles (1975) continued this thought in his book stating that:

> We are entering into a strange new world in which rapid change will be the only stable characteristic. And this simple truth has several radical implications for education and learning. It is no longer realistic to define the purpose of education as transmitting what is known (p. 15).

Since then information and technology have exploded. Guglielmino (2007) reported that in a study performed by the university of California, Berkeley "…new stored information almost doubled between 1999 and 2002, growing at an estimated 30% a year (p. 3). And even more astounding was the assertion made by Barth regarding knowledge, "In the late 1940's, an individual could expect to graduate from high school knowing 75% of what he or she would need to remain successfully employed until retirement. Fifty years later that figure was reduced to two percent. Garner (2007) addressed this phenomenon in her book stating that, "It is crucial that our students learn how to learn – how to 'figure out how to figure out' – so that they can make sense of the unfamiliar information they encounter on a daily basis" (p. XV). These facts led one to the conclusion that adequate preparation for future success extended well beyond simple childhood learning. Life-long learning and self-directed learning were crucial.

The National School Public Relations Association (1972) reported that changes toward self-directed learning resulted in more positive learning attitudes,

more positive self-concepts, more positive attitudes toward classmates and more favorable attitudes toward subject matter and school in general. It appeared that the benefits of SDL were numerous and could lead to an increased enjoyment of the educational experience by the learner. If we wanted to foster students' positive self-concepts we had to "…ask stimulating questions and provide opportunities for them to make mistakes in safe environments where they don't need to worry about 'feeling stupid'" (Garner, 2007, p. 23) or undervalued. We needed to enable them to become "reflectively aware of sensory data, visualize information, and ask questions and conduct experiments to figure things out on their own" (Garner, 2007, p. 22). By facilitating these skills we would help students face new information and meet challenges with a better understanding of how to process the information and work through the challenge effectively and with confidence. David and Roger Johnson summarized the impact of what I would consider best practice or the result of implementing SDL in this way:

> There is a great deal of research indicating that, if student-student interdependence is structured carefully and appropriately, students will achieve at a higher level, use higher level reasoning strategies more frequently, have higher levels of achievement motivation, be more intrinsically motivated, develop more positive personal relationships with each other, value the subject area being studied

more, have higher self-esteem, and be more skilled interpersonally (As cited in Gibbons, 2004, p. 4).

This was ultimately what I desired in my classrooms. I had to be completely open to the ideas within and closely follow the path of self-directed learning by making a faithful commitment to it. Gibbons pointed out that this change in the way we delivered and facilitated instruction represented a paradigm shift. Covey (1989) said that, "A paradigm shift is like a new pair of glasses; it affects the way you view everything in life" (125). Gibbons (2004) included this quote in her book, adding that we should all be wearing these glasses because they will allow us to view the shift to "brain and person compatible self-directed education" (p. 7).

THIS YEAR'S STORY

"The day is committed to error and floundering; success and achievement are matters of long range." - Johann Wolfgang von Goethe

I stood outside the classroom holding my breath, immobilized and afraid to make a sound. I heard voices inside – my students' voices. Gulp. I was on my way back from lunch in the faculty room and got caught up chatting with another teacher. I was a few minutes late. The students had already arrived at room 207. I imagined the worst – utter chaos – although no one was screaming. When I could move again, I walked cautiously through the doorway into the classroom. But, what I found there was not chaotic at all. It was wonderful! And it was working – SDL was *truly* working.

When I started my research I had no idea what to expect. I just knew that implementing Self-Directed Learning (SDL) skills sounded like a very effective way to approach gifted education –in fact, all education could benefit from the development of these skills. Everything that I had read about it led me to believe it would work in my classroom. But would my students embrace it? Would *they* believe in it? My students learned that what the teacher expected from them might be less than what they were willing to do. And that knowledge is dangerous. It prevents a child from going further and taking risks with her learning.

"Did I do enough?" was something I had heard far too often and it was a question I began answering with a question.

When I first heard it, I would look over the work and make suggestions. Eventually, I got to the point where I would not even accept the work from the student because I knew what I would be getting.

"Do you think you have done enough?"

Invariably, the student would look at me, turn her head to the side and respond, "Mmm…I could probably do a little more."

"Okay."

Where It Began

Generally, I didn't actually begin *pulling* my gifted students until the middle of September, as they needed time to become acclimated to the regular education classroom. So, my research began on the first day they entered my room. The President was giving a speech that day and it was supposed to occur during Intervention and Enrichment (I.E.) time for my third grade students. I had to rearrange the schedule slightly, so that I would even be able to have enrichment time with them. I implemented a short-term research project, to introduce them to the task of performing research and following the Independent Study Model (ISM). This was a model that I discovered one day in a search of the books on my shelf. It was a set of simple steps that I felt the students would be able to easily understand and follow. They were going to be performing

research on Constitution Day. Our initial meeting was frustrating, to say the least. The students were being *pulled* in all directions – not just by me. Various assessments were being implemented in the classroom, i.e., Math Fact Fluency and Developmental Reading Assessments (DRAs). The students came into my classroom in spurts. I introduced the lesson in "shifts." I explained the process to one small group of students, just as the next small group arrived. I explained the process to this new group and yet another arrived. I prayed this was not an indication of how the year was going to progress. But finally, I had the whole group present!

"Who knows what Constitution Day is?"

No one responded.

"Does anyone know what the Constitution is"

Still nothing.

I pointed to the Preamble to the Constitution that I had on a display easel and read it aloud to the students, explaining what each part meant to our country. Recognition slowly set in and they were able to verbalize what they did know. Their prior knowledge had been activated and they were connecting this new information to what they already had learned at some point. After a quick mini-lesson on the Constitution, I went over the eight elements of the Independent Study Model (ISM) with the students:

1. Select a Topic – I explained what selecting a topic meant, adding that I had already selected a topic, but in the future they would be selecting the topics.

2. Survey the Topic – I told them that this was a way to determine previous knowledge about a topic and to determine if there would be enough information to generate an effective product.

3. Product Plan – I shared with them that while I had already determined the product in this case – a 12-Sentence Report – that in the future they would be selecting the products.

4. Questions Developed – I listed Who, What, When, Where and Why on the board and modeled the types of questions they might generate.

5. Resources Located – I collected a variety of resources and had already placed them on a table in the back of the room with a sign that read, "RESOURCES." I also signed out the laptop cart, so that the students could use the Internet to perform research.

"Can anyone find resources in the classroom?"

Sarah pointed to the laptop cart. David looked at and pointed to the resource table.

6. Data Collected – I asked, *"Does anyone know what data is?"*

Sarah responded, "Data is information."

"That is correct."

7. Product Shared – I informed them that this would be the time that they would share the products they created with their peers in the enrichment room and possibly their classmates in the regular education classroom.

8. Study Evaluated – I alerted them to the fact that I would be evaluating them based on their performance during the research process and on their final products and that they would also have the opportunity to evaluate their own performance.

"I want you to be more independent with your thinking and your performance this year," I used David as an example and pretended to be checking off items on a rubric, *"Yes, mmhhmm, done, yes, yes..."*

They all laughed.

I set them to work and I walked around the room observing them as they worked. They were interested and quiet – focused on their task. I noticed some students taking notes in the Constitution Day journals I had prepared for them. I reminded the others that this would be a useful exercise to employ. I watched their faces closely, scanning them. I could see them thinking and hear them realizing things out loud. It was a wonderful gift to be able to watch students learning and gaining understanding. I walked up behind Mary in her seat. She had filled an entire journal page and her response was more than I could have anticipated! I commended her on an excellent response. I could

hardly contain my excitement when I later shared her work with her classroom teacher and with my principal (see Figure 4.1).

The end of I.E. period approached and I handed out Exit Tickets, using the journal stem statement: "One thing I learned today is…" The students set right to work responding. They got up and started to exit, handing me the tickets as they did so. I quickly surveyed them in the order they were received. I was pleased with the responses. The majority of students' responses had to do with the fact that Constitution Day was September 17th. A few students even mentioned Olga T. Weber, who suggested that we celebrate of the ratification of the Constitution.

My fourth grade students entered and were anxious to begin. I implemented the same lesson with them that I had just completed. And I observed the same type of response – interest and diligent work.

"I'm off on a great start!" said Tammy as she read from one of the resource books, "How did Constitution Day come about?"

A little while later, Sandra announced that she had finished with her research. I checked her journal – not nearly enough. I modeled questions for her to consider. A short while later, Abigail too announced that she had finished with her research. I checked her journal – not nearly enough either. I explained to the girls that their research should focus on good guiding questions and that there was no rush to get through it. I set them back on their task. I had the

students clean up a few minutes early and handed out Exit Tickets, using the same stem statement as before. Again, I was pleased with the responses (see Figure 4.2).

One day of research done. In my reflection after class I wrote:

> *"This was an interesting way to introduce ISM and Self-Direction. While I did not explicitly state it, it was understood that these skills represent self-direction. The students responded well and I think they will appreciate the freedom this entitles them to in the enrichment room."*

I was thrilled to have begun my research. I was anxious for the students to arrive two days later. However, they were fifteen minutes late, coming in after recess. I made a note to myself to address this issue with the classroom teachers. I had instructions on the board. Some students got right to work, while others joked around. I tried not to intervene, as I wanted to determine if SDL would reduce off-task time. I simply reminded them of the time. I continued to remind students of the time as the period progressed.

Each student eventually came to me for the 12-Sentence Report format paper and they all needed further explanation. This was our first attempt at this type of project and it would take some time and practice until they were comfortable. Time expired on the class period and when I announced that this was our last day on the project there was a room full of stunned faces. I

commented that they should remember that this was a mini-research project and we would be doing more of these. I reminded them to gather information as quickly as they could and to spend less time getting started or fooling around.

"Yeah, and when you giggle you disturb other people," Elizabeth said as she packed up her things.

I checked her Student Learning Needs Assessment and indeed, she indicated that she preferred things to be quiet when she was doing work (see Figure 4.3).

A number of students attempted to scribble down quick sentences before they left. I assured them that it would be okay, even if they were not done, and that they would mostly be evaluated on the work they had completed.

My fourth grade students arrived. They went straight to their folders and retrieved their Constitution Day journals. Tammy and Sally almost immediately appeared at my desk with questions. I answered their questions and they went back to their seats. They were all working well and were quiet, although they continued to ask me questions about Constitution Day. I continued to point them in the direction of the resource table.

Mallory asked me where the Constitution was today. I was not sure exactly where it was located, so I looked it up on her suggestion.

"The original handwritten document, signed by the members of the convention, is on display in the National Archives in Washington, D.C. Isn't that

amazing?" I asked, quickly adding, *"We are taking a field trip to the Smithsonian next Saturday!"*

Sandra was completely lost in the project and started writing up her information in her own "format." I told her to pick-up the format paper, but she had not. I reviewed the format paper with her and sent her back to her seat, better prepared. I glanced at the Student Learning Needs Assessment and noted that Sandra did not "like things being explained." This was interesting.

Tammy was the first one to finish. She missed the first *because* sentence, but it was now too late to edit. Time ran out and the girls were not finished. I reminded them that this was a new type of project and it was not really about how far they got, but more about how effectively they worked, what they wrote in their journals – did they answer the questions, reflect…etc. I told them it was more about all of the skills involved in the process, and not so much about the product. I handed out four Exit Tickets, using the stem statement, "One thing I will remember about the Constitution 25 years from now is…" A few minutes later I received four thoughtful responses (see Figure 4.4).

Upon reflecting afterward, I wrote:

> *"This is going to be a challenge – to get everyone working and on task, finishing projects in an allotted time that is relatively short. They are used to research spanning several weeks to months. Once I administer the TCT next week, I will begin to*

model self-directed skills with the students. It will be interesting to see if they progress in their ability to perform on their own. This is exciting for me and I wonder if it will reduce the need for me to redirect and remind them of their time. What are the ramifications for larger classrooms with regular education students, if this type of work is implemented? How will it impact other students? I was reminded today of the importance of the do-over. I will have the students keep their 12-Sentence Reports in their portfolios and if they wish to revise and resubmit them they will be allowed."

I had fifteen minutes free, in between my two groups, and I thought it would be a good habit to use this time to write my observations and reflections, which I did throughout the entire research process.

The Research Project

It was a full twelve days before I saw my students again. We started our long-term research project based on Natural Disasters. I had a video on tornadoes downloaded and ready to go when they arrived. I prayed that the projector would work! I informed them they would be watching a video on tornadoes and that the next video would be about earthquakes. In an attempt to activate prior knowledge, I asked them to share any facts they already knew

about tornadoes. The responses were, "Strong winds, damaging, form under very hot conditions, funnel/cone-shaped."

I asked them to stand and, *"Show me what it would look like if you were caught in a tornado."* Lots of twirling and swirling! This was for my kinesthetic learners!

I played the video.

In my log I typed: *"Could have heard a pin drop!"*

They were transfixed! As they watched, I pointed out some interesting facts from the video to ensure they understood what they were seeing and hearing. When the video was over we discussed it. Every student had a story to share. I listened to several and then focused them on the chalkboard. Together we generated a list of natural and what I called, "man-involved disasters." Every hand was raised and they came up with: Earthquakes, Tsunamis, Tornadoes, Fires, Hurricanes, Mudslides, Blizzards, Sandstorms, Floods, Oil Spills, Terrorist Attacks. I added diseases and explained that they could represent a disaster, if the number of people affected was great enough. I told them to really consider these topics because they would be choosing one for their research project and thinking about a prevention plan or a plan to minimize damage after a disaster.

I handed out a Know-Want to Know-Learned (KWL) chart with a Venn diagram attached. Just about all of the students were familiar with a KWL chart,

as well as the Venn diagram. The students were asked to write as many facts as they could about tornadoes and generate a number of questions, as if this were going to be their research project. On the Venn diagram they were asked to compare and contrast tornadoes and earthquakes. They needed little facilitation and were able to complete both. Before the end of the class, I handed out Exit Tickets and had the students complete the stem: "The one thing I will remember about a tornado is…" Most of the students commented about forming on hot days or forming in the sky. However, David had the most interesting response, "The one thing I'll remember about a tornadoes is that they can choose their own pathway."

What stood out most for me was that the students did not all come to the same conclusion about tornadoes. They mostly identified something a little different as being important or memorable (see Figure 4.5). I linked this to how they thought about things and the connections they had made to prior knowledge and experiences.

In my double entry log I wrote:

> *"The students beg me for Exit Tickets now. Their responses have been quite good, for the most part. This went fairly smoothly. The students seemed to enjoy the video and were able to take much away from it. Their completed papers went into the research journal, which is in their "portfolio*" (Hanging file folders in the

back of the room). *I gave them each a score on the work they had done. My rubric was based on the number of facts and the number of questions generated – I was looking for 5 facts and possibly 3 to 4 questions. Additionally, I was looking for work done on the Venn diagram. Most students received 3s, although a few did receive 4s. I also looked at the type of questions they generated – were they meaningful and critical in their design? They are still learning this process and I've got to continue to provide a lot of facilitation until they are ready to really do it on their own. I enjoyed this lesson – I feel like we are really going somewhere."*

Two days later, I had a video on earthquakes and volcanoes cued up when the students entered the room. Before we started though, I had them retrieve their new research folders. I also informed them I had scored their first research project. They searched frantically for their scores. Some were disappointed. I reminded them that they could revise and resubmit. I was fairly relaxed; the students were beginning to fall into a routine. Once again, they were completely focused on the video – quiet and still. Again, I handed out KWL charts/Venn diagrams and had them complete each. I watched the clock, reminding them to be aware of the time. I circulated the classroom reminding them of information provided in the video and asking questions to jog their

memories. I told them that I especially enjoyed the part of the video where the narrator compared volcanic deposits in the ocean to "cookie dough on a cookie sheet."

Aha! A teachable moment had presented itself to me, *"When we use like in comparing two very different things, what is that called?"*

They all had it on the tips of their tongues. We had gone over this numerous times before. Several students raised their hands, but Elizabeth finally came up with, "Simile."

Just before class ended, I told the students to put their research folders away and take Exit Tickets. I gave them two stem choices: "A volcano erupting is like…" or "When an earthquake occurs it's like…" I explained that they would be creating their own examples of simile. Most students completed the task with little problem. However, Sarah and Stephen struggled with this task for some reason. We ran out of time and they had to hand in cards with only the stem statement written on them. I thought about why this was an issue for them. Sometimes, if answers were being spoken aloud, the students had difficulty coming up with original work on their own. They did not want their responses to be the same as another person's. And, it was an abstract concept because no one in the class had been part of an earthquake before. I looked over the cards after the students were gone (see Figure 4.6).

Elizabeth was my poet. Her card read, “When an earthquake occurs, it’s like you’re in a salt shaker and you’re getting shook.”

Mary also rose to the occasion, “When an earthquake occurs, it feels like the world is falling down and it reminds me of when my dad dropped a big box.”

Both girls were able to understand the concept and complete the task, demonstrating both knowledge of simile and understanding of what an earthquake *may* feel like.

After the students left, I sat in front of my laptop:

> *“It has been interesting thus far. I don’t really see a direct impact and several of my students already have a handle on critical thinking ability. I worry that I will have nothing to report. However, I believe in the value of self-directed learning and the Independent Study Model. It gives a purpose to the work we do; it is not all for naught. My principal observed me this morning and he didn’t get to see much – at least I felt that way in the beginning. I had just started the research process with my second grade student, who has me all to himself at the moment. He had decided on prehistoric creatures – a sea creature – as his area of focus. We were “Surveying the Topic.” But as he did his searching on the Internet, he began to shift his*

position. I felt my heart sinking…I kept thinking, "Just pick something, please?" And he was waffling back and forth. My principal, who was sitting to my right, said, 'Boy it's really a good idea to survey the topic!' Basically he went on to say that as one does research, sometimes they find out there's not a lot of information on a certain topic, after they are already in the thick of it. Yes! I agree – it is important. Surveying the topic allows the student to decide if this is really the topic for him. Eventually I proposed that the student include all three creatures in his final product. He decided to do one from the Triassic, Jurassic and the Late Cretaceous periods. And he will be making a diorama-timeline. Some days I feel more like a teacher than others, I don't know exactly why that is. More planning time? Better lessons? Better me?"

Next? Tsunamis…and then we would begin the real research. The third grade students watched the video and were once again quiet and focused. I did not hand out a graphic organizer and I did not ask that they take notes. Instead, I questioned them afterward to see what they could recall. Afterward, I had them get laptops and their research folders. I instructed them to begin collecting information and writing down the sites they visited, so they could revisit them later. I was planning on assigning them to cooperative research groups based on

their topic, but Sally and Sarah paired themselves up all on their own. They were both working on hurricanes.

Sarah was searching for images and shouted, “Cool image from space of hurricane Katrina.” That was one of her focus questions, “Can hurricanes be seen from space?”

As I walked around the room, clipboard in hand, I noted whether or not students were on task and took some quick notes. David was always focused and today was no exception. He had three websites listed. He was surveying his topic. Stephen was having difficulty getting started. I redirected him several times, although this was just our first day of research. I planned on sitting with him during our next class meeting. Valerie had returned from Hawaii and got right to work. She even selected her topic. Mary commented that her stomach hurt and her discomfort might have caused a lack of focus. I noticed Elizabeth sharing a great deal of information with Stephen. I hoped that she would be able to help him maintain focus as they worked together.

The fourth grade came in and I implemented essentially the same lesson. The only difference was that at the end of class I asked the girls a question about a particular wall in Taro, Japan that was featured in the video.

“Why do you think the wall is shaped this way?”

The girls were able to make several good hypotheses, including one

about the wall's curved shape launching any water that came toward the land back out to sea.

Mallory and Abigail were working on the same topic – tsumanis. And Tammy and Sandra paired up, even though they were working on different topics – mudslides and the Black Plague. The girls worked well together in their self-made pairs. The fact that both classes had paired up into research groups on their own was a very self-directed thing to do!

I decided to change things up slightly for our next meeting. I introduced the students to the Six Thinking Hats, developed by Edward de Bono. Each hat represented a different mode of thinking:

- The blue hat represented metacognition – thinking about one's own thinking.
- The red hat represented intuition and emotion – sharing fears, likes and dislikes.
- The yellow hat represented brightness and optimism -- exploring the positives and probing for value.
- The green hat represented creativity – looking at possibilities, alternatives and new ideas.
- The white hat represented information – using the facts, just the facts!

- The black hat represented judgment – seeing potential problems and areas of concern.

I asked the students to choose a hat and write about the research process using the thinking represented by each hat. I thought this would be a good way to gauge critical thinking ability, as this type of writing would utilize higher-level thought. Overall, I felt they did a fair job – a number of students missed the idea, although three students did an outstanding job. I placed yellow Post-its on each paper and wrote my comments and whether or not I thought the student had "understood" the thinking of the hat, as well as a score (see Figures 4.7 and 4.8).

The fourth grade students completed the same assignment. They were asked to "wear a hat" and write about the research process. There were similar results: two students were able to complete the task and the other two missed the mark slightly.

For out next class, I left instructions on the board:

1. Go get computers from the 4th grade cart
2. Get research folders
3. Research & gather data
4. Generate questions

Emily entered first and I pointed out the instructions. She read and followed them. As other students entered, they too read and followed the instructions. I was going to use this independent work time to observe, but I

realized that I could utilize it more effectively to conference with students, and provide guidance and direction for their projects.

I heard a few students talking in the hallway as they approached the room. They entered, continued chatting for just a few minutes and then got right to work. I called the first student up, Sally. The other students continued working as I talked with Sally about the information she had gathered.

I asked her what her three research questions were. These questions would help her focus her research and eventually design an appropriate product: Hurricane names? How do they come up with the names? How long do they last?"

I told her these were good questions to start with, adding that she would probably develop more questions as she discovered more information. I invited her to step up to the big list of products, "Ways to Show Me What You Know!" so we could plan. I read off some options, explaining each product type to her. She decided on a newspaper about hurricanes. She looked very excited about her product decision.

I called Sandra up next and we worked in much the same manner. This continued with the other students. When I got up to circulate the room, I noted that everyone had made progress except for Stephen. I had to redirect him throughout the entire class period. He was behind. And when I sat with him at his desk, he told me that he could not "find anything." I commented that he

seemed to be the only student having any trouble and gave him so ideas for searching. He eventually did get to work and later, when he sat down with me to conference, he had come up with three good focus questions. I talked to him about the difficulty he'd had earlier.

"Sometimes, I think there is too much information on the Internet!" I said.

I told him his research would most likely be easier now that he had questions to help pinpoint his areas of focus. We took a moment to look over possible products. Stephen seemed to be very excited about the idea of developing a wanted poster to demonstrate what he learned during the research process. I commented that he got off to a slow start, but added that hopefully he would be able to make up for lost time.

I took a minute between groups to write in my log:

> *"Some of the products, I predict, are going to be exceptional and so highly creative – I am excited."*

The fourth grade entered. They followed the instructions on the board and got right to work – they were very focused. I called each one back to conference. They all had their questions ready and had done some quality work answering them. Each one chose a product format from the list. I wrote up their questions and their product choices, so I could keep track of them. They kept

busy and at the end of class I asked them to log out and shut down. They asked me for Exit Tickets.

I gave them a stem statement: "I am excited about my project because…" Sandra's response was quite introspective. Her engagement hinged upon her learning style and interests, "I am excited about my project because it is very interesting. It also has some of the things I like to read and learn about."

The other students' responses varied in scope (see Figure 4.9).

After they left, I reflected:

> *"I thought it was a good idea to conference. It gave the students a purpose for their research – a place to go with what they are learning. I am thinking about wrapping this project up soon and beginning another one that has them working all on their own – making all of the decisions. That could be interesting!*
>
> *Basically I am pleased with what I am seeing, although I don't yet see a correlation between the ISM and self-directed learning and critical thinking ability. I am going to begin Stories with Holes again. I think that activity will help build the critical thinking piece."*

Several days later, I was in the faculty room finishing up lunch, when I looked up at the clock. Oh no. It was three minutes to one! The kids would be coming soon. I rushed down the hall, approached the stairs and saw a colleague

coming my way. I stopped because I could see she wanted to talk. Only a few moments passed and I attempted to excuse myself as politely as I could. I dashed up the stairs and approached room 207.

And there, I nervously listened to my students before stepping inside.

On the board was a standard set of instructions I had been leaving. The students were mostly seated at their desks, with their laptops open and their folders in hand. Others were at the hanging file folders (I called them portfolios to distinguish them) getting their research folders. The students with laptops were already logged in and were beginning to do research.

I told them I liked the "industriousness" they were exhibiting and added that their coming in and getting right to work was very impressive (and self-directed).

It was working – SDL was *truly* working! Somehow, without my realizing it, they had begun developing independent skills. I, of course, had seen it, but just not put a label on it. But, label or no that was what they were doing.

Simon Time

I handed out the rubrics and took several minutes to explain how they were arranged (see Appendix F). The beginning categories were all the same, but the product assessment category was different on each rubric to reflect each student's individual choice.

In her book, Judy Willis (2006) mentioned changing things or surprising the students to generate excitement and interest, "Enthusiasm is generated when students are presented with novelty," (p. 19). So, I turned around and wrote, "Simon Time," on the board. This was something new. I explained to the students that if they had any questions or issues, they should sign-up for "Simon Time." I told them that I would sit down with each student at my desk and help to facilitate his or her research. Almost immediately three names appeared on the board. And then a few more.

David came up first. He brought his laptop and his concerns. He was so quiet when he came to the enrichment room the first time. Said very little, but I knew how much thinking he was doing. He did *not* like mistakes. In fact, he made it through the entire year of second grade without one spelling mistake on anything: spelling tests, writing assignments, explanations in math…etc. He was having trouble deciding between two different sites – to determine which was the better resource. I asked him to pull up each one and we went through the data. His question was, "What was the deadliest volcano?" I told him that deciding which site's information to use depended on his criteria for determining what, "deadliest" meant. We chatted for a few minutes. I explained that for me, "deadliest" meant death totals and perhaps he should use the site that listed those totals. He agreed. Determining appropriate criteria is a higher-

level skill. And providing this discussion might enable him to make similar determinations in the future. At least, I hoped so.

David's name was erased from the board.

Sarah was next on the list. Sarah was one of the most easy-going gifted students I had ever come into contact with. She never complained, never asked why we had to do something and always wore a smile – even when she was having difficulty. I believed that she was aware of her own ability to work her way through anything, and that contributed to her assertiveness. She too had a site-related issue. She could not locate a site that mentioned the year they started using women's names to identify hurricanes. I helped her navigate to a site that provided this information. She was pleased.

Her name disappeared from the list.

Mary was next, *"Do you need your laptop or research folder?"*

She nodded.

I told her she should get them and come right back. She looked slightly confused as she approached my desk a second time. I think this new system was the root of her confusion. She sat down next to me. Mary was already a critical thinker when she arrived in enrichment. And she was one of my strongest students in that area throughout my research. She had this look about her, as though she was always in deep contemplation – connecting the day's thoughts and ideas to her existing knowledge. She had her three questions written down

and some notes. We chatted about the location of tsunamis – where most occur. I reminded her about the video we watched on tsunamis and that we learned about the *Ring of Fire*. I could see the look of recognition on her face – prior knowledge had been activated. I suggested that she add that to her search.

The chalk eraser moved over the board.

Valerie had a question about types of tornadoes. She was one of those children that you just knew would be successful in any endeavor she pursued. Her peers admired her. She was self-confident and fearless. And, her work was typically fully developed and exceptional. I explained that tornadoes were classified using levels. We located information related to F-level, wind description and velocity. This seemed to be helpful to her and I anticipated that it would increase the depth of her product.

As the eraser once again eliminated a name from the list on the board, Elizabeth meekly arrived.

She was a very quiet reflective student, with a poetic voice of a much more mature individual. Very nervously, she asked me if she could change her project. She was unsure about her first choice, almost immediately after she chose it.

"Of course. What do you want to do instead?"

While she searched through the list, my principal entered. He was doing a quick walk-through. He stopped and talked to each student, asking him or her

questions about the research. The students, undaunted by his presence, easily answered his questions about the work they had completed. Elizabeth decided on a poster. She seemed much more decisive and pleased with this choice. She was last on the list.

The eraser lay motionless in the chalk tray. The students were totally engaged in their research.

Two fourth grade students entered the classroom – not my students. They'd come to inform me that their class had signed out laptops during this time – the laptops we were using. My mistake! I forgot to check the sign-out sheet. I told my students to log off, shut down and walk the laptops to the appropriate classroom. When they returned, I informed them that for the last few minutes of class they could have game time. Squeals of delight erupted, like a volcano bubbling over.

They rushed to the shelves where the games were stored and quickly found their favorite games. I sat down in front of my laptop and opened my log:

> *"Ugh! I didn't have time to check the computer sign-out sheet! No one ever uses them during this time. My mistake – feeling just awful! I will check in with the teacher in a few minutes. The kids LOVE free time at the end of class – they all gravitate toward their favorite activities."*

Before I dismissed them, I once again told them how proud I was for their ability to enter and do what they needed to do and get right to work. I told them they exhibited, *"Great independent skills!"* They loved the praise and seemed very proud of themselves, as they all cheered, "Yay!"

Later, after I checked in with the other teacher, I wrote in my log in pencil:

"She was not mad at all ☺"

Fourth grade entered at their usual time. The girls retrieved laptops and got right to work. I handed out the rubrics and explained the arrangement. I also explained "Simon Time." Three of the four signed up immediately.

Mallory came up first. She was a happy child, but I would describe her as a very serious student, for the most part, although she did have her silly moments. They all do. Her parents were very involved with her education and always wanted her to move faster.

She was concerned about the completeness of her research, "I've answered all of my questions."

We went through what she had collected. She had a question about the average size of a tsunami and the damage caused. I asked her about the range of damage. She commented that whole islands had, "drowned." I explained that this was probably the result of an extreme tsunami that only occurred every 40 to 50 years or so, and that she should also look for smaller or mid-range

tsunamis to determine what type of damage they caused. I wanted her to consider criteria.

The fourth grade students were just as interested in having the chalk eraser fulfill its job – to help keep order.

Mallory's name came off the board.

Abigail walked to my desk and sat down. She was a twin, who had a nervous laugh that she placed at the end of most of her comments and questions. She had been on an Individualized Education Plan (IEP), for speech, but had been provided the support she needed to move to strictly a GIEP. She didn't know where to go with her questions. I put her questions in order for her, based on subject, and made a few suggestions for some other questions to "humanize" the tsunami. She would be conducting an interview with a tsunami for her final product.

Abigail's name vanished and Sandra became the name at the top of the list.

Sandra wanted to print out a picture of an outfit one doctor wore when working with Black Plague victims. She was one of my most creative students. She was also one of my strongest writers. She strived to be different from everyone else and never settled for anything. I saw why she liked his "uniform." It included a mask with a long beak – like a bird's. It would become the focal point on her book cover.

She was having difficulty locating a picture with enough resolution to enlarge. I attempted to help her locate another appropriate picture. When I managed to find a picture, she told me that she preferred the "real" picture she had found earlier. I took a moment to explain that there would not have been cameras around during the time that the Black Plague occurred. We continued to search until an appropriate substitute was found.

Before she left, she wanted to know if she could begin her final product – a book jacket for a book about the Black Plague. I said that she could begin to plan it out on paper.

"I have it all planned in my head."

I believed her. However, I told her I wanted to see something on paper – a quick sketch – because I could not see inside her head. She returned to her seat and began sketching.

Tammy was anxious to chat. There was a brief tousle over the eraser, but Tammy yanked it free and erased Sandra's name, and now hers was the only one on the board.

She gently placed the chalk eraser back on the tray and turned to pick up something. She came running back to me with a plan for the cover of her newspaper. She was very excited! I asked her if she had collected all of her information.

"No."

"Then why are you planning?" I asked.

She responded that she thought of the idea and didn't want to "lose it." I told her that was fine and I liked her response. I realized that flexibility might be needed here. If the students had ideas, the important thing was to get them out. I didn't really matter in what order the process occurred – just that it did occur.

Tammy's name remained right where it was on the board, as the girls were busily working. No thought given to the established protocol. The chalk eraser was still and just as quiet as the girls.

Afterward, I wrote in my log:

> *"I can tell she is always thinking ☺"*

My principal entered the classroom. I had asked him to write up something about what he observed previously, with the other group. He said he would be willing to give me some feedback. I informed him that this group was doing the same work. He briefly sat with two students, Sandra and Tammy, to discuss their projects. When class ended, I had the girls clean up and return to class.

As they left, Tammy grabbed the eraser and took care of her name.

In my log on this day, just two simple thoughts:

> *"Today was wonderful! I always wonder what Bob is thinking when he enters my classroom and I am at my desk."*

I stared blankly at the vivid green chalkboard and the stock-still eraser in

the tray – the hint of names still visible under the filmy, white dust that swirled underneath "Simon Time."

Time Is My Enemy

It was October twenty-first. I thought about how little *time* I actually had with my students and how *time* was slipping away from me, as I wrote the instructions on the board:

1. Laptops
2. Folders
3. Research or Planning

I reminded the third grade students to check the board for instructions. I explained that if they considered themselves to be "experts" on their topics *and* if they felt they had collected enough information, they could begin planning their final product. Once they completed planning: created a layout of the finished product, labeled different parts and generated a list of items needed, they should to sign up for "Simon Time." At that point, I would call each student back to conference with me and show me her plans.

The routine was comfortable at this point and they were all on task. The room was very quiet, as Mary approached the board and wrote her name. I called her back to my desk to check her list of items/resources. It seemed complete. I sent her back to her desk to draw a picture of what she envisioned her final product as – she was making a model of a tsunami wave. She returned

in two minutes with an exceptional rendering. She asked me if Elizabeth could help her do some of the work. And an idea came to me. Could they work cooperatively on the same project?

I called Elizabeth back to ask her about it. She was unsure. It was fairly clear that she preferred the idea of creating her own project. And, while she was able to work in a pair or group, as she noted on the Learning Needs Assessment, I could tell that the idea of a final product created by two people was not what she wanted. She returned to her desk to discuss the matter with Mary.

David, Sarah and Sally had all signed up. David came toward my desk when I called him. One of his questions was about volcanic eruptions; there were three theories. His dilemma was in the fact that he felt he had to choose one. David second-guessed himself frequently. He needed reassurance about where he was going with his project. He needed to know that he was doing it correctly. I told him he could mention that there were three theories and perhaps list a bit of information about all three. He returned to his seat.

Sarah was next. She had a list of the top five worst hurricanes on her computer screen. Only one had a name because the other four predated the system used for naming storms. She explained that she didn't really have a question – she said just wanted to share this information with me. I decided that what she really wanted was to have the information corroborated – to make sure that what she understood was correct.

Sally came to my desk. I got the sense that she didn't understand the purpose of the planning.

"I'm doing a newspaper."

I grabbed a copy of the Express Times from my desk and showed her that there were sections. I asked her to use a similar format for her product. I added that maybe she could write an advice column informing readers of what they could do if there was a hurricane or she could include a story about a really terrible hurricane.

"I want you to share the information you collected in a creative way," I said as she turned to go back to her desk.

Elizabeth arrived. She had an answer to my question regarding cooperative work, "No." However, I was pleased to hear her say that she and Mary had discussed the idea, but they could not agree on the specifics of the product. I told her it was okay. It was late and class was over. I had the students clean up and return to their classrooms.

Fourth grade would be in soon.

The girls came in and got right to work. Tammy put her name on the board for "Simon Time" straight away. I called her back. She only needed help searching. Abigail was next. She had a great number of questions for her interview with only "Yes" and "No" responses. I explained to her that the interview would be much more interesting if she expanded somewhat on her

responses. She needed constant help. Five minutes later I noticed that she could not find information for one of her questions. I made a note of this in my log.

Mallory signed up on the board. I called her back.

"I don't have anymore questions," she looked at me.

"Well, do you feel like an expert on your topic? Have you collected enough information?" I watched her face.

"Yes."

"So, you can start planning."

I explained that she should get a sheet of paper and begin making sketches of her tsunami model and list items she would need. She was going to show what it looked like after a tsunami hit – the devastation. She was a very directed student and did not require much help. However, she did need suggestions for her product plan. Her sketch was very simple and needed more.

Sandra brought me all of her pictures and information. She was anxious to get started. I told her I wanted a sketch of the book jacket. She followed my directions and returned a bit later with a very simple sketch – just shapes on a page. She wanted to know if she could begin working.

When I said, *"No, not yet,"* her response was, "Darn!"

"You're excited. I get it. And I like that!" I told her.

We discussed the plan a little further and I cautioned her that the design

shouldn't just include the computer-generated images that she printed. She should also include some original artwork, some of her own drawings. She informed me that she was planning on adding her own work. I realized that she was ready to start. I could feel the excitement in her.

The class was winding down and all of the girls were anxious to begin what I called the "creative part" of the project. Sandra was working on her book jacket cover. She was adding hand drawn elements. I instructed the girls to log out, shut down, put laptops away and return to their classrooms.

I thought about the events of the day:

> *"Today was a good day. The students seem to have a good handle on the routine and get right to work when they come in. It is very self-directed at this point, allowing me to observe and take notes. This is a positive! However, I am really not sure that my TCT is going to demonstrate the changes in the students' thinking. I just don't know if there will be a correlation. But, I'm committed at this point and will see this research through. The writing may provide me with a better look into their level of thinking in the end. I think I need to do more writing with them about the process and the project."*

A few days later, I was writing the instructions on the board:

1. Laptops

2. Folders

3. Research or plan

4. Begin product

The third grade students entered the room. Sarah immediately signed-up for "Simon Time." She had a question about the categories of hurricanes. She found a hurricane that occurred in New England in 1938. She was using two different sites. The sites had the information listed differently – one site classified it as a category 3 and the other site had it at category 5. We had a brief chat and I told her that when in doubt, she should consult a third source to try and get the most accurate information. And this became yet another teachable moment when I noted that often typos or misprints could be included on a site. I added another possibility might have been that the person, who created the site may not have had all of the pertinent information. She returned to her seat to continue searching.

Sally signed up and approached my desk. She needed guidance on her newspaper project. She had a rough sketch on paper. Again, we looked at the Express Times and considered possibilities for additional sections in her own newspaper. The conferences were shorter now in length. Did this mean more self-direction?

Sarah signed up again – still confused about the conflicting information. Four more sites with different information – two listed the storm as category 3

and two had it listed as category 5. I went to my laptop. I looked up hurricanes in New England in 1938. I printed the article with the wind speed listed at 100mph. I told her to compare that speed to different category descriptions for wind speed. I saw information that set criteria for a category 4 hurricane from 131mph to 155mph. After considering the information we determined that her hurricane was a category 3. However, Sarah was not satisfied; she needed more conclusive evidence! She went back to her desk to continue her search.

David came to my desk with his laptop. He was searching for information for a new question he'd generated, "Why do volcanologists explore volcanoes?" After some discussion, I found out that what he really wanted to discover was why they chose that profession. I turned to my laptop. I found a video on YouTube – an actual volcanologist was speaking. I thought it might be helpful to him, so I set him up in the back of the classroom – less disruption.

Sarah was back! She said another website listed it as a category 5, with winds over 100mph. As we looked over the site together and read more, we discovered that when the storm hit land, it was lowered to a category 3. This was the why some sites had it listed as a 3 and others as a 5. It was both.
Sarah was ecstatic to have worked through figuring out this problem. Ah learning!

I was still searching for an answer to David's question. I found an interview of a female volcanologist on *Volcano World*. The first question was

about why she chose her profession. I printed it out and showed it to him. I was really excited because this would provide him with a real response about a career in volcanology.

At this point, Sarah stood up and announced, “Done with my research!”

I congratulated her and asked that everyone in class give her a round of applause for completing her research. They laughed and applauded. Then Janet stood and announced that we did not applaud for her when she completed her research. She got a round of applause too. And then I had the entire class gives themselves a round of applause for all of their hard work.

Janet came up with her planning paper in her hand. It was a tremendous rendering of a game board entitled, “Earthquake Mania.” She had question and answer cards and had drawn buildings on the game board itself. She decided to use dice to allow the players to move, if they correctly answered the questions about earthquakes. I was very excited to see her finished product.

The third graders cleaned up and cleared out. Fourth grade entered a little while later. They followed the instructions and got right to work. The girls were chatting as they worked. Sandra continued to work on her book jacket and Abigail and Mallory were working together to do research. Tammy stood before me and asked if she could write an article about Guatemalan mudslides in her newspaper.

“Yes, of course. It is your newspaper, right?”

She happily skipped off to her seat. Sandra needed clarification about her book jacket project. She wanted to know what was supposed to go on the back. I told her that using the information she collected, she should pretend as if she wrote the book, adding that it should be a summary of her information or what would be inside the book. Sandra was so creative and I was anxious to see her finished product.

All of the girls were working very quietly that day and were completely focused on their work. They seemed to have a purpose – the endpoint.

Tammy wanted to know if she could make a picture that she'd found on the Internet larger.

"Unfortunately, no, I can't do that," I replied.

I recommended that she try and locate an image that is larger to start with. Sandra had forgotten her Black Plague book in her classroom and asked to go and retrieve it.

Tammy shouted ecstatically, "I found it!"

She located another picture. Unfortunately, when she clicked on the new image, it was the same size as the previous image. I told her that in her finished product I would like more of her own original artwork and less computer images. I informed her that using a bunch of Internet photos was not the same as taking the time to draw and incorporate objects. I also reminded her that they were technically someone else's photos. Together we looked for

another photo, which we found. She went back to her seat. Not much later, she was back though. She said she couldn't find any other good pictures. I helped her search and locate some other photos. She looked relieved.

It was still very quiet in the classroom and the girls remained focused on their work. Sandra asked me a question about her project and began to explain how she was going to set up the pages inside her book. She also told me that the Black Plague was more of a medical disaster.

"Yes, I know," I said.

"Then why did you let me do it," she asked.

"Well, a lot of people died, so it was a disaster and I thought it was interesting. In fact, probably more people died from the Black Plague than from many other disasters combined."

She seemed satisfied and told me she was considering making a graph that would compare the totals from the Black Plague versus tornadoes, earthquakes, tsunamis...etc. She brought her book cover over to me and explained how she made a "squishy title and author" for her book jacket. Very outside the box thinking! At first, I questioned why she did it. It didn't really make sense to me. But I quickly let go of that stifling thinking because it made complete sense to her.

Tammy asked me about the size of another photo she found – is it too big.

"Yes, but you can make it smaller," I said and showed her how to drag and drop the photo into the document program.

I had the girls clean up a few minutes early, so they could get an Exit Ticket. They had been bugging me consistently for Exit Tickets and this provided a perfect opportunity to have them comment on the research process (see Figure 4.10). What was the best part so far, how has it helped them or *has* it helped them?

Once I sat down, I had time to reflect:

> "*Another day of observation and still I don't know how it is going to impact critical thinking ability. I see the students coming up with more questions as they work – several of them have developed some tremendous plans for their products. I know that all of these skills are enhancing their critical thinking ability – I just doubt that a test is the best (Most appropriate) way to measure. I was so excited when I found it though. I really need to focus more on the self-directed skills. Time to hit the research again, I think. I still have time to implement Open-Ended Checklists! They would be a great way to gauge critical thinking ability."*

All of the students were working on their final products now. There was

little time to observe directly, as I spent the entire class period facilitating work, directing and mixing papier mache. Making the papier mache was time consuming, but I couldn't wait to see Mary's final product! Third grade class time was a blur and then they were gone, although I did manage to take some photos while they worked. I also sat down with Stephen for a few minutes to give him direction. He was working on his wanted poster. I shared with him some of the things that might be on a wanted poster and we looked at some samples on the Internet. I enjoyed seeing the products take shape and evolve.

Fourth grade arrived and because the girls were working so well independently, I had time to think and reflect a bit:

> *"I am pleased with how the students worked today – this (the creative part) is part of the payoff from all of their hard work during the research process."*

Tammy was working on her newspaper. Abigail was practicing her interview questions. Mallory was painting broken Popsicle sticks to use as debris in her model of the after effects of a tsunami. Sandra was generating a bag graph to demonstrate the total number of deaths from disasters. Tammy needed me to constantly assure her that she was "doing the right thing." I reminded her that it was not my paper, but hers. I had many conversations on this day with students in regards to direction of their products. Working with the

students, for me, was much more interesting and gave me a chance to talk to them and determine their thinking.

My log page read:

"I took photos of each student working – they were thoroughly engaged and working effectively. Except for Stephen. His product is a little disorganized and "sloppy." It appears as though he cannot cut in a straight line. The products can be overwhelming because everyone is doing something different and they all want to ask me how and what to do. I normally respond that it is not my project. The fourth grade students are working well – chatting and discussing their products. They step in to help each other often. I worry that I won't have enough time to really determine anything. As this whole observation turned into a reflection on what had and was occurring today, I don't need a separate listing. I have so many other things I want to implement this year, but I need to get the research work done first. It's distressing because I think some of these other activities might help increase critical thinking and I think some of them have the potential to be self-directed as well."

It took several minutes to get everyone set up today – getting paints, taping, setting-up fonts, printing…etc. All of the students were wrapping up

their work and should be finishing up with their projects in the next few class meetings. I wanted the chance to assess them, but in a more realistic way. I devised a writing response prompt. I announced the writing assignment to groans. But, I moved forward and I asked them two questions: "How do you think you have done so far on the research project – the work you have completed up to this point?" and "On what part did you do your best work?"

I told them they should use complete sentences and they would have to provide support for their responses. I allowed them to "write" on their laptops, which I believed would increase interest and engagement in the activity. The students were silent and focused.

I observed a lot of "hunting and pecking" with one finger. The majority of the students were not used to the idea that they could use both hands to type, although Valerie was typing with both. This project was coming to an end for everyone and I wanted to begin some short-term research projects – using affective-cognitive activities. I was curious to see if they would transfer their newly acquired skills to a new project. After third grade exited, I read their responses. They were all quite good – some especially good. Valerie did a thorough job of supporting her thoughts (see Figure 4.11). In order to evaluate their work thus far, it required that they utilize critical thinking skills to consider their own effectiveness.

Fourth grade entered. I used the same writing response prompt with them, but as an Admit Ticket. The students were actively engaged in the writing and appeared to be considering what to write and what they had already written. When they finished, I collected their cards to review them (Figures 4.12 and 4.13). The girls started working on their products. Abigail was ready to record her interview with the tsunami. I tried, in vain, to record her interview using a video camera, but could not. Technology issues – Ugh! I would have to try something different next time. It was frustrating, but it did allow her to consider what could go wrong during a project or be a possible issue – like reading from scripts on the table. We would have to work on the generation of her product a little.

Abigail was stuck with nothing to do. She could not move on until she recorded her project. I would need to figure something out for her. Mallory was cutting out landforms to add to her tsunami model, so I had Abigail help her. Tammy was typing articles for her newspaper. I had the girls clean up and return to their classroom.

When they left, I opened my laptop:

> "*I am hopeful that we can wrap up the projects soon and move on to other short-term projects and things. I want to start doing more Stories with Holes and Lateral Thinking Puzzles, as well as Think Tank. I think these activities will also help increase critical*

thinking ability. And, I will be able to see some self-direction within each activity. I need to find a specific model or develop my own for modeling these skills."

It was our first day back from Thanksgiving vacation. A new student started in the enrichment program that day. We were officially at the end of the research project, so she and another student, who had finished, began work on the next project – writing an original, narrative Christmas/winter story.

As the day progressed, more students completed their final products. There was a great deal of talking in the classroom, although I realized they had just returned from a break and needed time for socializing. I was not worried, as I knew they would all be finished soon. Sally had almost completed her newspaper and it looked amazing! I suggested that she might want to add a crossword puzzle.

In reflection, I noted:

"I think we are still in holiday mode ☺ I just don't have it today – what is wrong with me? I am so out of sorts! I couldn't get into observation today either. I don't have much to discuss. I am looking forward to the storybook project. I will need to administer the TCT one more time! I need that piece of data. Ugh!"

The students all finished their research products – one by one – within the next few days (see Figures 4.14 through 4.25). I became conscious of the end being near. And perhaps the end was overdue. I felt it was time to conclude *my* research and think about making connections within the data and linking up the literature to what I had observed. It was also time to administer the final round of the TCT, my post-assessment, which I did on a blustery day in early January. The results were fairly good, I thought. There were three students whose scores decreased by only 1 point, two of whom had started with the highest scores; two students whose scores remained the same; and there were seven students whose scores increased by 1 or more points. Three of those students' scores demonstrated gains of 7 or more points. Yet, I still struggled with the fact that I only saw these students for approximately two hours per week. Had what I implemented really been the cause of the increases I saw? Was it even possible to make a direct correlation between the development of self-directed skills and critical thinking ability? I didn't know for sure. I couldn't know for sure, could I?

And so, with these concerns in mind, I handed out eight sheets of crisp, white, lined paper on January 6th. I asked my third grade class to reflect on the research process: How did they think it went? What insights did they gain? Did they enjoy self-selecting and completing a different type of product? How did they feel about the work they'd completed?

I was somewhat optimistic. Surely their answers would be full of interesting insights about the research process and would exemplify critical thought. I collected their papers and set them aside. I would need time to really read through their responses – to develop a sense of what they'd really taken away from the process. My fourth grade students were given the same task – same white, lined paper. Again, I set their finished products aside. When the bell rang at 3:25 that day, I stuffed them into my date book as I prepared to leave. I'd look at them later on that evening at home.

I did not look at the papers that evening. Or the next. Or the next. I found them almost a week later…untouched, but still crisp and white and lined, and still stuffed in my date book. I took them out and skimmed over them hurriedly. Nothing jumped out at me and grabbed me around the shoulders, shaking me to alertness…yelling,

"This is it! It's really something, isn't it?"

There was nothing. I put the papers away – tucked them neatly into a folder.

And then one day, I sat at my desk peering out over the snow on the ground and through the trees in front of my house writing up my research. I remembered those papers. Maybe they were worth looking at again? I carefully removed them from their folder. This was what I found there, in my students' words.

Sally was proud of the work she'd completed, especially with her newspaper. She appreciated the fact that it was hard work, but that she finished. She explained the process she used and what research should be put together. She had compared her data and determined which was most relevant and would connect to other data within her product, based on her own criteria and understanding of the topic.

David evaluated his work, saying it, "went great." He considered the fact that he only included three websites, but that he had enough information to create an effective product – a painting of an exploding volcano and a report. He noted that he found a mistake, but that he managed to get passed it. This was monumental – at least for David! He had made a mistake, but was able to understand that he could still move forward.

So many times I had heard myself utter, *"There can be beauty and understanding in mistakes."*

David also participated in a critical examination of his own resources and content of his completed product – again, based on criteria he'd considered.

Mary said the research process, "took a lot of knowledge," but that it was fun. She explained her work process in creating the model of the tsunami. She said that she had to do research on the computer, but that she found a lot of interesting facts. Mary understood that hard work could lead to accomplishment and knowledge.

Sarah said that, “doing a poster about hurricanes was a good way to learn about them.” She felt as though she learned a lot during the process and hoped to be able to do it again. Sarah’s comments told me that she appreciated self-choice of the product and she understood her own learning strengths and needs – that she wanted to express her knowledge in different ways.

Stephen, my procrastinator, did eventually finish his wanted poster. He said he, “felt good when it was done.” There was pride in his accomplishment. Even for student who struggled, there were gains.

Janet liked the research process and learning facts about her topic – earthquakes. She enjoyed creating a game board because it was fun and could be played with afterward. She noted that there was a lot she didn’t know about earthquakes prior to her research. She commented that the project took a great deal of work, but that it was, “worth it in the end,” adding that this was the most fun she’d ever had with a project. She noted the difference between what she knew about her topic at the start and her new learning. She was aware that she’d made gains – gained new understanding. She also saw the value in creating something that would continue to persist and be lasting – more so than a simple report.

Valerie felt that following the ISM helped to keep her organized. She explained how she moved through the process. She enjoyed being able to self-select a topic and product type, as well as having had ample time to complete the

work. She was able to understand that following appropriate steps makes logical sense and can help to maintain focus and organization. And she also found excitement in self-choice.

Mallory found this part of the project satisfying too, “I also like how we got to choose how we wanted to present it instead of having the choice made for us.”

Tammy was thrilled that she had time to confer with me and echoed the opinion on self-choice, “I like that we had Simon Time and got to talk to Mrs. Simon.” She went on further to say, “I think that if Mrs. Simon didn’t give us the choice of the kind of research progect were doing and what we were doing it on it would be a lot less fun.”

Self-choice was a vital part of making this work.

Abigail found contentment in the entire process, “I loved my research project,” adding, “I like these research projects we do and I would like to do them every two months.”

Sandra commented on the self-choice aspect as well, but what I found most interesting about what she said was that she wanted to continue to work in this manner and that she found joy in the learning, “I hope we do something like this again. I liked learning about something that I didn’t know anything about.”

And finally, Elizabeth addressed a thought I didn’t even dare to hope for in my young students: passion! She said that following the research process,

"was a great way to get a lot of creative ideas out of me." She was able to look at her finished work and consider all of the effort she put into it. She thought about, "the passion and hard work," and it felt good. She also said that she was, "looking forward to something like this again." To me, this represented passion for learning and life-long learning.

I couldn't have said it better myself.

There was so much I had overlooked the first time through! But, within their thoughtful responses, was something worth examining. All sorts of critical thinking had gone on as they wrote that day. They had participated in self-evaluation, considering the overall quality of their completed products. They had thought about the research process and following the simple steps of the ISM and how that allowed them to gain insight and kept them organized. The pride of accomplishment they felt and were able to verbalize was wonderful. They understood that feeling successful in the classroom made them want to continue learning and doing more projects like this one. I didn't see it the first time through, but upon closer inspection of their thoughts and words, I did. They appreciated the hard work because it gave them greater understanding. It wasn't just about the end result; it was about the journey and the learning that occurred. This was what I had hoped for. It was not about the scores on some paper and pencil test. It was something more. Self-direction existed and moved in all of these children. And its essence had come through in their words.

Earth-shattering? No.

Compelling? Quite.

FINDINGS: DISCOVERING MEANING

"Education is not the piling on of learning, information, data, facts, skills, or abilities - that's training or instruction - but is rather making visible what is hidden as a seed." - Thomas More

As I looked back over the research and considered everything my students had done – the TCT, reflective writing, Admit and Exit Tickets, and the hands-on projects they had wholeheartedly thrown themselves into, resulting in wonderfully creative products – I was overwhelmed. Where would I put the greatest amount of focus? What was important about my research? I felt successful, as though I had accomplished something worthwhile. They had definitely become self-directed and were quite comfortable working their way through the steps of the ISM. However, I revisited the artifacts in search of a natural conclusion – something tangible – to put my finger on as proof that indeed they had increased their critical thinking ability. What was the meaning of all of this work? Did it have meaning? How would I even begin to answer my question? I found solace in the themes I had developed, using my coding data. Much of the data came directly from my double entry log, but some I gathered from Admit/Exit Tickets and Reflective Writing samples.

(I have not altered the students' responses where quoted. They appear as they were written.)

1. ***The desired outcome -- what I wanted my students to be able to know and do – of implementing self-directed learning skills was to create***

learners, who were more independent and would take responsibility for their own learning, and who were self-directed and could think more critically, leading them toward the development of life-long learning.

The most overwhelming realization throughout the entire research process involved the moment when I stood outside my classroom door listening nervously to my students inside. Then, after having taken a step inside, discovering them participating in SDL.

- In my log I wrote, "When I entered the classroom, the students had gotten laptops and most had their folders and were logged in and sitting at their desks." They had followed the instructions I left for them on the board. They were acting responsibly and with purpose. And in the reflective writing samples, I discovered glimpses of their critical thinking ability.
- During a reflective writing experience, David was asked to "wear" the black thinking hat that was concerned with being cautious and identifying possible hazards and problems. He responded this way about the research process, "Some problems that I might see are that one website might have more info then another…I will use caution if there are inappropriate websites." He was able to respond both appropriately and critically after regarding some of the issues he might face.
- Elizabeth also put on one of the thinking hats; her hat was green. The green hat dealt with creativity and new ideas. Her response demonstrated

her understanding of the red hat and how it impacted her thinking about the research, which was highly critical in nature. I was amazed at her comment, "The mind shows creativity for the project and the project shows the creativity." She understood creativity on multiple levels.

- In the course of her research, Sarah stumbled across conflicting information. Two sites listed the same hurricane at two category levels – one at 3 and one at 5. She was not satisfied with settling on one or the other and was determined to discern the truth. She continued to search different sites until she finally determined that one had the storm listed at sea and the other when it made land, which caused a downgrade in the severity of the storm. Her thinking during this process was highly critical, as she surveyed a number of websites and sifted through articles with an attention to the details.

2. ***By implementing a variety of learning opportunities that were differentiated, activating prior knowledge and generating connections to new learning, utilizing knowledge of individual learning styles, and including cooperative interaction, as well as the use of different types of assessments - Admit/Exit tickets, graphic organizers, modeling and discussion designed to facilitate support…etc., it was my hope that the students would become more self-directed and thus be able to think in a more critical manner.***

The combination of differentiated assessments allowed me to get a really good look at my students. The Admit/Exit tickets were a snapshot of their immediate learning and thinking.

- Mary's learning? "One thing I learned today is that Constitution Day was started by Olga T. Weber." However, it was her response in the journal that left me in awe, "The Constatution of the United States is the basik law of our nation – like these rules are for a game, only these rules are for the government, and all citizens must play." This was an exceptional example of critical thinking.
- The reflective writing samples provided a more in depth look at their thinking over time, as one of Valerie's reflective pieces was able to reveal, "I think I have done pretty good so far on the project. I think so because I feel that I've done plenty of research to complete my project and I've typed up the Diary quite well. I feel very confident this will turn out great. I did my best on typing up the Diary. I think the research I've collected fit's nicely on how I typed it up using humor and how I blended in the information with the tornado's life so when reading the Diary, you can enjoy the funny thoughts while learning something new. I am really enjoying this project and I am very happy we got to do it. And those are my thoughts! Thank you for the opportunity to be able to do this project!" Valerie consistently wowed me with her writing ability, but the insight she

was able to access here was just tremendous. Most of the comments were generated in the same manner.

3. ***There were a number of daily challenges that I faced, including time constraints, confusion and frustration on the part of the students, lesson implementation issues, and technology issues, but reflective planning enabled me to adapt delivery and instruction and provide appropriate support for my students.***

Every day brought with it new understanding and challenges. Some days brought more challenges than others. At several points in the typed pages of my log, I noted the challenges: constraints, confusion and frustration, the lesson implementation issues, and of course, the technology issues. One side of my log was for observations and lesson implementation (Observed), the other for interpretations or my feelings (Felt) on what I observed.

Observed: On September 14th, I wrote, "Students were being pulled out for various assessments (Math fact fluency, DRA's), so I had to introduce the lesson in shifts."

Felt: It was, "…a little frustrating." I also noted that the President's speech was supposed to occur during Intervention and Enrichment (I.E.) time that day. My time.

Observed: On September 16th, I wrote "The third grade students came after recess, so they were 10-15 minutes late." Next to that, I later wrote in pen,

"ISSUE." Time constraints were something that I'd been dealing with since I started teaching. It could sometimes be difficult to schedule the gifted seminar and depending on what was happening elsewhere in the building, students could be held up, arriving late or having to leave early.

Felt: I wrote, "I may have to discuss this with their classroom teachers." Eventually, I did, "…speak to the 3rd grade classroom teachers about students arriving late." This resolved the problem.

Observed: On September 28th, "I had a video on tornadoes downloaded and ready to go when the students entered the classroom."

Felt: We had lost a number of staff the previous year, especially in the technology department, and I knew I was on my own with the technology. I wrote, "I was just praying that the projector would work. We no longer have CTC's in our buildings. Luckily it worked just fine ☺" On several occasions, I experienced issues with technology and I knew other teachers had as well. It was just something that came with the technological territory.

The last example is something that happened between planning and implementation, but was able to reflect and correct it afterward, before the next class. I introduced the lesson with my second grade student. I had him alone at that point, as there were no other second grade students identified. I provided the student with sources of information, i.e. articles, books on, and copies of the Constitution for our Constitution Day project. I had signed-out the laptop cart, as

an additional source of information also. What happened? The student wanted to use a laptop to search for information. The problem? There was too much information on the Internet. He had tremendous difficulty maintaining any type of focus on the topic. I had to really guide him through a variety of websites and help him find information. I realized this could be a disaster when I implemented the lesson with my research group. Twelve students…each one trying to focus, as they are all yelling, "I can't find anything!" What did I do? I gave it some serious thought. And after reflecting in my double entry log, I put the laptop cart away. My next group of students was directed to perform their research using only the sources I had provided. It went much more smoothly the second time around, and the third.

4. ***The implementation of self-directed learning opportunities and student choice could lead to greater student engagement/focus, student interest, motivation, and pride in products and performance.***

I was able to witness this outcome every day in my classroom. Focus and engagement were exceptionally high, which I believed was due to heightened student interest. They chose their research topic and they decided what type of product to generate. And they made most of the important decisions there were to make about their products – they were invested.

- According to Mary, "I think that soon I'll be an expert with tsunamis. I know I'll like doing my research. I think I won't fall behind. I think

research is all about having fun and learning a lot. I think my parents would be very proud of my work. I like what I am researching."

- Abigail said, "I think I've done good and am working hardest on this project then any other. I think I did my best work on looking up the research because I had a lot of questions."
- I was surprisingly pleased with what Stephen had to say, "I think that I did great so far because I am close to being done with my progect." I just need to do a little bit more work then I will be done. I did my best work on the research part of the project I found what the biggest tsunami ever was. It was the on that hit Alaska. It was 1720 feet tall! I am doing a wanted poster for my project."

5. ***Diverse and appropriate assessments, based on the individual learner and specific product or type of performance, led to a better understanding of the student's current ability and served to measure authentic learning involving self-direction and critical thinking.***

I relied mainly on the writing samples I'd collected, but I did still have the TCT results – pre- and post-SDL implementation. And it *did* represent another form of assessment. So, I looked at it again. I had learned that a second look could bring new insight.

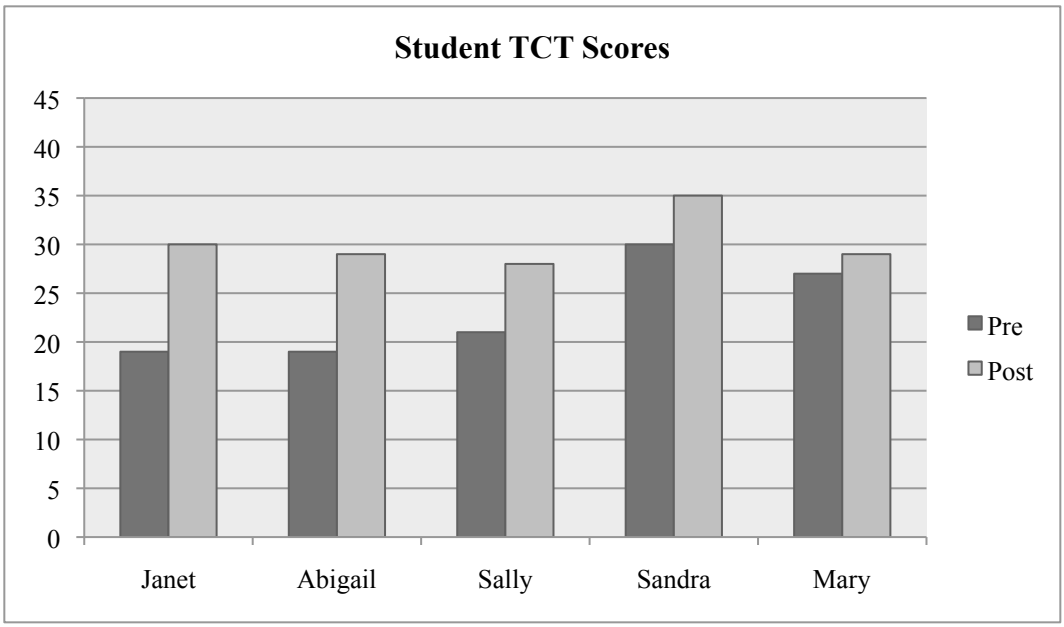

Table 5.1

While the data were not entirely conclusive across the student population, I started to take a closer look. This table represented the scores of the students, who made the most significant gains in critical thinking ability, as determined by the TCT, from the pre- to post-SDL implementation. The test consisted of 45 questions that were followed by a selection of multiple-choice responses. Janet, Abigail, and Sally's increases were noteworthy, while Sandra and Mary made modest gains. Overall increases ranged from 1 to 10 points. Two students' scores remained the same and two students scores decreased by 1 to 3 points, although these students' scores were among the highest in the initial round of testing.

When I looked at this data, I became even more curious about whether or not SDL skills were at the root of the growth. It seemed plausible. I revisited the

writing samples I had collected looking for clues yet another time. The awareness of their simply phrased responses, combined with the results of the TCT, led me to believe that the work we had done together in my classroom had truly made a difference. My students were definitely more self-directed and critical thinking ability *had* increased. The TCT showed gains in critical thinking ability, and for several students the gains were quite significant. However, I continued to pin the brunt of my beliefs about critical thinking to the writing samples. They seemed to provide the most tangible evidence – proof of my students' thinking.

Another individual could easily come along one day, and dispel my conjecture regarding what occurred in my classroom throughout the months of research and observation. They could say I read too much into the reflective writing pieces. They could say that I was wrong about self-directed skills and critical thinking ability – that they were not that important. But recently, in my school district, I was asked to take the Pennsylvania Technology Inventory (PATI). As I answered the questions about *21st Century Skills*, I began to feel as though they were directed specifically at me – like they were looking right through *my work.*

These skills included:

- Creativity and innovation
- Communication and collaboration
- Research and information fluency

- Critical thinking, problem solving and decision making
- Digital citizenship
- Technology operations and concepts

There were a number of questions regarding knowledge of and readiness for teaching these skills. However, the one that I found most relevant to my research was, "How would you describe your readiness to build student ability and attitudes toward life-long, self-directed learning? I was swiftly, and with complete conviction, able to select one of the pre-determined, multiple-choice circles representing my possible responses.

"I feel very well-prepared." Click.

WHAT ABOUT THE FUTURE?

"Success seems to be connected with action. Successful people keep moving. They make mistakes, but they don't quit." - Conrad Hilton

And so, I kept moving. I knew I would make mistakes. But I was learning. I continued to implement self-directed learning in my classroom and the students rose to the challenge every day.

As we completed the research project, the students all approached me, one-by-one, and asked, "What should we do now?"

"What would you like to do?"

"Huh…what do you mean?"

"Well, what would you like to do next," I repeated, adding, *"Of all the projects and things we have done…what is something you would like to do? I want you to plan and implement your own project."*

This seemed to shock them somewhat at first. But, they all recovered and were able to self-select projects: more research projects, writing a chapter book, reading a book and developing a project upon completion. Additionally, I had two students who were quite accomplished at poetry. I wrote specific short-term learning outcomes into each of their GIEPs involving creating original books of poetry and painting watercolor illustrations to accompany the text. While this project was not self-selected the prospect of writing poetry on their own and peer editing for each other excited them. We had studied a variety of poetic formats:

Acrostic, Abecedarian Acrostic, Cinquain, Diamante, Free Verse Poetry, Haiku, and Tanka. They were instructed to choose whatever formats they were most comfortable with, although I asked that they attempt to use more than one. They would be submitting their finished work for consideration in a contest held by a public library. I also considered submitting their finished work to publishers, to give them the experience of preparing and sending out a manuscript.

And now, the students continue to work independently and to visit my desk often, asking questions or seeking guidance and advice, although I have not written "Simon Time" on the board since the research ended. I rarely have to redirect anyone and my students continue to be focused and busy. A few have already completed a second research project. I have a wonderful poster on cockroaches and an informational picture book about butterflies. And just as they finish one project they are already planning the next one in their heads.

I suppose they don't "want to lose it" as Tammy put it during one of our "Simon Times."

They are excited to begin and repeat the process again and again – to continue to learn and develop their skills and create. I can see and hear them thinking and making determinations about where to go with their projects – thinking critically *and* creatively. I love and am thrilled by the flexibility my position affords me; I am able to take my students where they want to go and allow them to choose the way they will arrive there. I am pleased with what I

learned about my students and about self-directed learning. And I am quite hopeful that more and more people in the field of education will begin to embrace self-direction as a valuable way to increase a number of vital skills for their students.

In the future, I hope to do more work with self-directed learning. However, while most of the results were tremendous, Stephen's focus issues still concern me. He has been able to complete his other work since the research project, but I will need to plan for other *Stephens* who may come my way – develop tools to support them. The other thing I need to consider is the assessment piece. While the TCT initially left me feeling elated, I was later less excited about its validity. The writing is what I need to investigate further. I think more modeling and practice with reflection is crucial.

I have spoken to my principal regarding the benefits of SDL on students. Recently, I read an article regarding an experimental high school program that involved self-direction. What occurred was transformative and exciting. Students, who were close to dropping out, were "brought back" to the joy of education and learning – "the passion and hard work," as Elizabeth so eloquently put it. My principal and I are now discussing how it might impact low academic ability students. And I am most curious about what I will see, if indeed, I push-in to a "regular" classroom and work with students of all abilities using an SDL model. For me, the possibilities SDL present seem limitless.

EPILOGUE

I sat there in front of my laptop typing and listening to Schubert. As my own children heard the music from the hallway, they entered one-at-a-time to ask, "What are you listening to?"

"Schubert," I called over my shoulder to my daughter.

And then again, "What are you listening to?"

"SCHUBERT!" I responded more loudly to the annoyed sound in my son's voice.

Schubert evolved into Beethoven, as the instruments melded together at some point. I was concentrated on writing and did not notice the shift. His Symphony #9 entered the room, quietly at first, but determined. I was searching for the words to eloquently bring my paper to an end – much like the manner in which I searched for the most appropriate words to begin my paper. I found them. I typed my final sentence.

And suddenly – it was truly like some divine signal – his "Ode to Joy" was straining against the speakers, "La la da da dum la la la, dum dum, da da…daaa, da da!"

It was awesome and I felt joyous and totally uplifted! I made a mental note to play that for my students when they completed their next project.

I smiled…I was finished. And even though I knew there were still edits ahead, I will never forget that feeling!

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APPENDICES

APPENDIX A: HSIRB Approval Letter

APPENDIX B: Principal Consent Letter

APPENDIX C: Parent Consent Slips

APPENDIX D: Sample Student Admit Ticket

APPENDIX E: Student Learning Needs Assessment

APPENDIX F: Sample Research Project/Presentation Rubric

APPENDIX G: Student Product List

APPENDIX H: Research Process Rubric