WHAT DOES THE LITERATURE ON DIFFERENTIATED INSTRUCTION RECOMMEND TO TEACHERS WHO WANT TO MEET THE NEEDS OF ALL THEIR STUDENTS?

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WHAT DOES THE LITERATURE ON DIFFERENTIATED INSTRUCTION RECOMMEND TO TEACHERS WHO WANT TO MEET THE NEEDS OF ALL THEIR STUDENTS?

Kristine Andersen

Across the nation, today's classrooms are filled with students who have very different abilities, backgrounds, experiences, interests, and learning styles. It is difficult for teachers to meet the needs of all students. According to educational literature, one way this can be done is by using differentiated instruction (Alison & Rehm, 2007; Friend & Pope, 2005; Levy, 2008; Lopez & Schroeder, 2008; Rock, Gregg, Ellis & Gable, 2008; Tomlinson, 2000; Valli & Buese, 2007). Differentiated instruction is a process where the teacher matches the learning objectives, how the student learns, and how the student demonstrates what they have learned to the student's ability level, interests and learning styles (Tomlinson, 2004). Throughout this paper, it will be explained how to begin using differentiated instruction, methods, strategies, and examples. It will be explained why differentiated instruction especially impacts struggling students and gifted and talented students. The challenges and benefits of using differentiated instruction will also be described.

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Chapter 1: Introduction

Differentiated instruction is a process where the teacher matches the learning objectives, how the student learns, and how the student demonstrates what they have learned to the student's ability level, interests and learning styles (Tomlinson, 2004). A teacher may choose to differentiate the lesson's content, process, product, or sometimes all three (Adams & Pierce, 2004; Anderson, 2007; Benjamin, 2006; Levy, 2008; Nordlund, 2003). For every lesson, teachers decide on the need to differentiate based on the student's ability, interests or learning styles (Adams & Pierce, 2004; Anderson, 2007; Perini, Strong & Thomas, 2004; Stetson, Stetson & Anderson, 2007; Tomlinson, 2000). There is a vast amount of literature and research on what differentiated instruction is, what the benefits and challenges are, how to implement differentiated instruction into a classroom, and how teachers can meet the needs of all students in their classroom by using differentiated instruction (Rock, Gregg, Ellis & Gable, 2008).

Statement of Problem

Teachers face diversity in their classrooms everyday. Students come to school with very different past experiences, backgrounds, cultures, interests, ability levels, and learning styles. Teachers must teach the same curriculum and in most subjects teach mandated standards to all students no matter their differences. This student diversity poses challenges to teachers (Alison & Rehm, 2007; Friend & Pope, 2005; Levy, 2008; Lopez & Schroeder, 2008; Rock et al., 2008; Tomlinson, 2000; Valli & Buese, 2007). How can teachers meet the needs of all students in their classroom?

Research Questions

What does the literature on differentiated instruction recommend to teachers who want to meet the needs of all students?

1. What is differentiated instruction?
    a. Why should teachers use differentiation because of students' abilities?
    b. Why should teachers use differentiation because of students' learning styles?
    c. Why should teachers use differentiation because of students' interests?
2. How is differentiated instruction used in the classroom?
    a. What are some methods/strategies?
    b. What are some examples?
    c. How do teachers get started?
3. How does differentiated instruction help students who struggle because of:
    a. Learning disabilities?
    b. Attention difficulties?
    c. English language learners?
4. How does differentiated instruction help gifted and talented students?
5. What are the challenges of differentiated instruction?
6. What are the benefits of differentiated instruction?

Significance of Research Problem

Teachers do not need to be told that the students in their classes are very diverse and have very different needs. It is often difficult to teach a lesson and reach every student in the classroom because students have a variety of abilities, interests, and learning styles (Alison & Rehm, 2007; Friend & Pope, 2005; Levy, 2008; Lopez & Schroeder, 2008; Rock et al., 2008; Tomlinson, 2000; Valli & Buese, 2007). Teachers can try to spend more time with students who are gifted in a certain subject or struggle with an objective, but there is only so much time allowed in a class period or day to do that. Teachers can have a variety of different types of lessons during a unit to try to match the interests and learning styles of their students, but every lesson will not meet the needs of every student (Lopez & Schroeder, 2008; Nordlund, 2003).

Differentiated instruction is a process where teachers may choose to differentiate the content, process, or product (Adams & Pierce, 2004; Anderson, 2007; Benjamin, 2006; Levy, 2008; Nordlund, 2003) to match a student's ability, interest, or learning styles (Adams & Pierce, 2004; Anderson, 2007; Perini et al., 2004; Stetson et al., 2007; Tomlinson, 2000). Differentiation allows the student to learn the objective in a way that they will best understand it and at their level. The student will feel confident about the material instead of overwhelmed or confused. The student will show interest and enjoy learning more (Delaney & Shafer, 2007; Lopez & Schroeder, 2008; Perini et al., 2004; Stetson et al., 2007). Research has also shown that students show academic achievement and improvement when learning by differentiated instruction (Anderson, 2007; Cusumano & Mueller, 2007; Lopez & Schroeder, 2008).

Limitations and Assumptions

The research for this paper will be limited to sources that are less than ten years old. The research on this topic is broad and deals with differentiated instruction that occurs in an elementary school and secondary schools in a variety of subject matter. A variety of topics about differentiated instruction were researched such as primary research on differentiated instruction, and secondary literature that describes methods, strategies, positives, negatives, how students will be affected by differentiated instruction, how teachers will be affected by differentiated instruction, and how teachers can begin using differentiated instruction.

The assumptions of this paper are that there is a great need in our regular elementary and secondary classrooms to meet the needs of students with very diverse abilities, learning styles, and interests. It is assumed that students will be successful learners if their needs are met, they are working up to their potential and at their ability level and their learning styles and interests are accommodated.

Definition of Terms

1. Differentiated Instruction is a process where the teacher matches the learning objectives, how the student learns, and how the student demonstrates what they have learned to the student's ability level, interests and learning styles (Tomlinson, 2004).
2. Content: What is being taught? The standard or objective (Levy, 2008).
3. Process: How the standard or objective is being taught (Levy, 2008).
4. Product: How the student is assessed whether or not they learned the standard or objective (Levy, 2008).

5. Scaffolding: Supports that teachers supply to students that help bridge the gap between what the students can do and what they need to be able to learn or do by ways of encouragement, modeling, hints etc (Carolan & Guinn, 2007).
6. Tiered Lessons: Tiered lessons are lessons in which you have different groups of students working together to master the same concept, but in different ways (Adams & Pierce, 2004).
7. ELL: English language learners (Allison & Rehm, 2007; Nordlund, 2003)
8. ESL: English as a second language (Allison & Rehm, 2007; Nordlund, 2003)
9. AYP: Adequate yearly process—All schools in the United States must show adequate yearly process and this is measured by mandated standardized tests (Rock et al., 2008).
10. IEP: Individualized Education Plan—A plan created by a school for students with special needs (Nordlund, 2003).
11. KWL: A method used in teaching which stands for: what the student Knows, what the student Wants to know, and what the student Learned (www.squires.fcps.net/library/research/kwl.htm)
12. MCA: Minnesota Comprehensive Assessment, which is a state test given to Minnesota students in various grades.
13. ADD: Attention Deficit Disorder (Allison & Rehm, 2007)
14. ADHD: Attention Deficit Hyperactivity Disorder (Allison & Rehm, 2007)
15. Jigsaw: A cooperative learning method used in teaching (Allison & Rehm, 2007)
16. Think Pair Share: A cooperative learning method used in teaching (Allison & Rehm, 2007)

Summary of Statement

So far, it has been described what differentiated instruction is, why there is a need for differentiated instruction to be used in today's classroom, what can be differentiated in a classroom, the limitations and assumptions of this research paper, and the definition of terms used throughout the paper have been described. More details about all of the above will be described throughout the rest of the paper, and also what types of students are affected by differentiated instruction and how they are affected. How teachers can differentiate instruction and examples of how teachers have used differentiated instruction will be given. Research that describes the benefits and challenges of differentiated instruction will be also be described throughout the rest of paper.

Chapter 2: Research Findings

What Is Differentiated Instruction?

Differentiated instruction is a process where the teacher matches the learning objectives, how the student learns, and how the student demonstrates what they have learned to the student's ability level, interests and learning styles. Differentiated instruction is a way of adjusting teaching and learning so the needs of all students can be met and maximum growth can be achieved (Tomlinson, 2004). Differentiated instruction is not a new idea, as it has been used since the days of one room school houses (Anderson, 2007). Differentiated instruction can be used for just one lesson or a whole class can be differentiated all year long. Either extreme can be beneficial to meet the needs of a wide variety of learners in a classroom. Differentiated instruction does not mean that teachers create individualized lessons for each student, but rather it is a way of thinking about teaching based on the fact that students are diverse with a lot of different needs (Friend & Pope, 2005). Teachers just simply vary their instruction for individuals and small groups to create better learning experiences (Stetson et al., 2007). When teachers differentiate their instruction, all students are challenged and receive different levels of teacher support and responsibilities (Friend & Pope, 2005). Teachers do not need to differentiate every part of a lesson, but rather either the content, process, or product (Adams & Pierce, 2004; Anderson, 2007; Benjamin, 2006; Levy, 2008; Nordlund, 2003). Once a teacher has decided to differentiate the content, process or product teachers need to decide if the material needs to be differentiated based on students' ability, learning styles or interests (Adams & Pierce, 2004; Anderson, 2007;

Perini et al., 2004; Stetson et al., 2007; Tomlinson, 2000). It is recommended to only differentiate one of the three (Levy, 2008).

Why Should Teachers Use Differentiated Instruction?

Today's classrooms are filled with students with a variety of needs and come to school with a wide range of experiences. There is a need to educate all students such as those students who are at risk of school failure, have cultural and language differences, are disadvantaged, slow learning, gifted and talented learners, involved in special education, have race, ethnicity, and socio-economic differences, and students with different educational histories, and family values (Nordlund, 2003). These students are expected to perform the same when it comes to standardized tests. This puts a lot of pressure on a teacher and can make a teacher's job very difficult. Often times, it is easiest for the teacher to teach to the middle, but then a lot of students needs are not met; not just students who struggle but also gifted and talented students (Lopez & Schroeder, 2008; Nordlund, 2003; Rock et al., 2008). Teachers can try to spend more time with students who are gifted in a certain subject or struggle with an objective, but there is only so much time allowed in a class period or day to do that. Teachers can have a variety of different types of lessons during a unit to try to match the interests and learning styles of their students, but every lesson will not meet the needs of every student (Lopez & Schroeder, 2008; Nordlund, 2003).

Teachers have many students on IEP's (individualized education programs) in their classrooms. Students on IEP's have a wide variety of needs from emotional, learning disorders, and physical handicaps. These students are expected to learn the same material at the same rate as all the other students. This can often times be very difficult

to achieve. According to the National Education Association's report entitled "Failing Our Children," only 30% of students with IEP's were proficient in reading and math, and 26% of schools did not make AYP (adequate yearly process). There are six million students with IEP's, so therefore four million (70%) lack proficiency in math and reading (Neill, Guisbond, & Schaeffer, 2004). According to the Twenty-Sixth Annual Report to Congress on IDEA (Implementation of the Individuals with Disabilities Act), 96% of general education teachers have students with learning disabilities in their classrooms (Office of Special Education and Rehabilitative Services, 2004). This is no surprise to many teachers. Teachers recognize that the grade level work is often too hard, so the work is modified and the number of assignments is reduced. This often does not work and students fall farther behind in school (Rock et al., 2008). Because of the very diverse population of students that teachers have in their classrooms every year, something has to be done to ensure that every student is learning. Differentiated instruction is one way to meet needs of a very diverse student population.

How Is Differentiated Instruction Used in the Classroom?

Teachers can choose to differentiate instruction based on abilities, learning styles, and interests (Adams & Pierce, 2004; Anderson, 2007; Perini et al., 2004; Stetson et al., 2007; Tomlinson, 2000). It is important for both teachers and students to understand their learning styles (Delaney & Shafer, 2007; Friend & Pope, 2005; Lopez & Schroeder, 2008; Perini et al., 2004). "Learning styles are described as the preferred way a student understands and learns" (Lopez & Schroeder, 2008, p. 8). As stated earlier, students in United States classrooms are very diverse, so in order to reach every student to ensure that every student is learning teachers can match their instruction and assessments to a

student's learning styles. Howard Gardner's eight multiple intelligences include: verbal/linguistic, logical/mathematical, visual/spatial, interpersonal, intrapersonal, bodily/kinesthetic, musical/rhythmic, and naturalistic. Students possess all eight levels, but function best using a few of them. Students should be exposed to all of them so they can determine their intelligence strengths. Students can take a multiple intelligence development survey to identify their learning style strengths (Delaney & Shafer, 2007; Lopez & Schroeder, 2008). An example of a learning style survey can be found in appendix B.

An action research project was done in a two different middle schools in the Midwestern part of the United States. One of these schools was in a big city and one a small town. The objective of the project was to try to teach to each student's learning preference, so they could experience academic success. The researchers required the teachers to learn about their students' learning styles, and they did so by having the students complete a survey. The results of the surveys showed that most students prefer the interpersonal learning style. Students with interpersonal learning styles are very social people and prefer group work. This type of learning preference is not often seen as much as individual work time, which is what intrapersonal learners prefer. Students with intrapersonal learning styles are quieter more withdrawn students who prefer to work alone. Ironically, intrapersonal learning style was the least popular with these middle school students. Traditional teachers also spend a lot of time lecturing, which is difficult for the visual/spatial and bodily/kinesthetic learners to sit through. Visual/spatial learners prefer to learn in such ways such as drawing and designing. Bodily/kinesthetic learners prefer to learn by moving around, touching or building. Linguistic learners prefer to

learn by reading and writing. Logical/mathematical learners prefer to learn by experimenting, questioning, and calculating. Musical learners prefer to learn by listening, singing and tapping (Lopez & Schroeder, 2008).

Once the teachers involved in the action research project learned about their students learning styles, they then had to differentiate their instruction to match their curriculum and/or assessments to the students learning style preferences. The researchers then wanted to see if the use of differentiated instruction based on learning preferences was increasing academic success, so they used a variety of assessments to check for understanding. What they found was that all students but one performed better on assessments in "school A" when differentiated instruction based on learning styles was used. In "school B", they found that almost all students, but especially low level students, performed better on assessments when differentiated instruction based on learning preferences was used. According to Lopez and Schroeder (2008), "approximately 95% of students turned in their work on time and achieved better than average grades". Students also reported that they felt empowered to know their own learning style (Lopez & Schroeder, 2008).

Another action research project was done where students took a multiple intelligence assessment to recognize their strengths. Students then did a project depending on their multiple intelligence strength and then took an assessment that was the same for every student. One hundred students were surveyed on their experience and the students found this style of learning to be fun, humorous, it increased their learning, and helped their memory. The teachers involved in the action research project confirmed the ideas of the kids (Delaney & Shafer, 2007).

Students enter into school with a wide variety of interests, experiences and backgrounds (Alison & Rehm, 2007; Friend & Pope, 2005; Levy, 2008; Lopez & Schroeder, 2008; Rock et al., 2008; Tomlinson, 2000; Valli & Buese, 2007). Students work best when the curriculum and their interests match (Tomlinson, 2000). Sometimes it is difficult match the students' interests with the content, but it is important to consider the students' interests when choosing or having them choose their assessment. Student's interests can be learned by having students write down their interests and the teacher keeps their lists for future lessons. Students can also just simply be able to choose their essay topic or science experiment topic (Perini et al., 2004).

It is apparent that students have a wide range of abilities, learning styles, and interests. The next question is how do teachers use differentiated instruction to meet the needs of such a variety of learners? The teacher will need to decide if the material needs to be differentiated based on ability, learning styles, or interests (Adams & Pierce, 2004; Anderson, 2007; Perini et al., 2004; Stetson et al., 2007; Tomlinson, 2000). Then the teacher will need to decide if they want to differentiate the content, process, or product (Adams & Pierce, 2004; Anderson, 2007; Benjamin, 2006; Levy, 2008; Nordlund, 2003). It is recommended to only differentiate one of the three. Content is what the student needs to know. Process is how the student will be learning. As stated earlier, students may be learning based on their ability, learning style or interest. Product is how the student will demonstrate what they know, and there is a number of ways in which to do this (Levy, 2008).

First of all teachers need to identify what it is that each student needs to know or be able to do (Adams & Pierce, 2004; Carolan & Guinn, 2007; Friend & Pope, 2005; Nordlund, 2003; Rock et al., 2008; Tomlinson, 1999, 2000). Nordlund (2003) recommends learning your curriculum by teaching at least a year in your subject or grade and after that choose to differentiate the instruction. However, state and federal standards often determine what each student should know (Adams & Pierce, 2004; Carolan & Guinn, 2007; Friend & Pope, 2005; Nordlund, 2003; Rock et al., 2008; Tomlinson, 1999, 2000). Teachers often pace their curriculum to get in all the standards that are state mandated by the end of the year. According to Tomlinson (2000), teachers should incorporate the standards into their curriculum and not let the standards be the curriculum. The joy of learning should never be replaced by the fear of passing a test. Teachers should not only concentrate on the students who might pass the standardized test, but all students included lower level and higher level students. As stated earlier, it is the responsibility of the teacher to make sure all students are learning. So, after it is determined what content needs to be taught, the next thing that you want to determine is what the student knows (Adams & Pierce, 2004, Brimijoin, Marquissee, & Tomlinson, 2003; Friend & Pope; 2005; Guskey, 2008; Levy, 2008; Lopez & Schroeder, 2008; Perini et al., 2004).

What the student already knows about the content can be determined in several ways such as: oral questioning, KWL (what the student knows, what the student wants to know, and what the student learned), group discussions, pre-tests, looking at student data from standardized tests, and brainstorming. If a teacher is going to use a pre-test to assess what the student already knows, this pre-test should be very specific to the unit or

lesson and should question students on material that they need to know. Teachers can learn a lot about the ability level of their students by looking at standardized test data. It is important to look at a variety of tests to ensure the data seems correct (Brimijoin et al., 2003). An example of a KWL chart can be found in appendix C. What the student knows and wants to know is filled out before a lesson begins, and the what the student learned section is filled out after the lesson.

After you have determined what it is that needs to be taught and what the student already knows, there are a few more tips a teacher can follow before actually implementing differentiated lessons. It is important that differentiated instruction is viewed as a positive experience for students by everyone. An atmosphere of cooperation and not competition must be established for both students and staff (Nordlund, 2003). Differentiated instruction is not just about strategies, but also about creating a classroom environment that encourages students to feel confident, feel challenged, a sense of community, a place where all students feel they have something to contribute and they feel respected and valued. All students need to be considered important and the teacher needs to build a strong relationship with each student, and students need to be recognized for their individual abilities (Nordlund, 2003; Perini et al., 2004; Rock et al., 2008).

According to Nordlund, another must for using differentiated instruction is to always begin with success. She states that "if we let a child begin instruction where he feels successful, this child will be willing to take more risks as learning becomes more motivational and successful" (2003, p. 12). This is especially true if students have not been successful before. Sometimes students feel it is better not to try than to look bad and fail (Nordlund, 2003). It is the teachers' responsibility to ensure that all students are

learning, therefore teachers need to remember to be flexible in order for learning for every student to take place (Anderson, 2007; Levy, 2008). Teachers also need to anticipate the areas that students will be successful and where they may struggle (Friend and Pope, 2005). Teachers can then plan modifications for challenged learners and expansions for gifted students (Friend and Pope, 2005; Nordlund, 2003).

Like all classrooms, a differentiated instruction classroom needs to be well managed. Students need to have a secure routine in order to use differentiated instruction because the process of learning and assessments are always changing but the routine should not. Some students struggle with change, which is why you need a class routine, so variety from differentiated instruction can bring excitement to learning (Adams & Pierce, 2004; Benjamin, 2006; Nordlund, 2003). Support from your principal, other teachers and support staff is also something that can make a differentiated classroom or lesson go more smoothly (Friend & Pope, 2005; Nordlund, 2003). It is also recommended to start using differentiated instruction by changing one unit or activity and each year add more differentiated lessons (Adams & Pierce, 2004; Friend & Pope, 2005). The final tip for using differentiated instruction is for the teacher to always set goals and reflect on their skills of teaching differentiated instruction (Friend & Pope, 2005; Rock et al., 2008).

A teacher who differentiates provides opportunities for every student. Teachers do not need to lower their expectations for certain students, but rather differentiate the content, such as finding a book with the students reading level (Anderson, 2007). If students can go beyond the content, then why hold them back. Students who are below grade level or who have not mastered background knowledge should be working on the

part of the content they can understand (Levy, 2008). According to Rock et al. (2008), students work slightly above their level when teachers give them support. It has also been found that challenged learners often require more direct instruction when the content has been modified, while a more capable student or group of students would be able to engage more in independent learning. Direct instruction also is necessary if a student who is working independently by themselves or in a group and does not master the content (Nordlund, 2003). One way teachers can differentiate the content according to ability level is to group students so they can process the content while doing an activity or assignment. For example, after all students read the same story, ability groups can be formed and one group determines simpler things from the book, such as character and plot. Another group with higher vocabulary skills might be asked more in depth questions about the story and specifics about the characters. Some groups may also be given more time (Anderson, 2007).

When students are broken up into ability groups to learn different content or to learn the same content in a different way, it is important that students are challenged and that the students are not just doing busy work. One group of students should not be doing a fun experiment while the other group is doing worksheets (Adams & Pierce, 2004). On the other hand, students need to understand their differences. According to Brimijoin et al. (2003), a teacher who used differentiated instruction explained to the class at the beginning of the year that the data from tests will determine groups. The teacher found that students did not question the grouping at all or complain about each group's differences. According to Nordlund (2003), if you are using differentiated instruction for

only a few lessons a year, then it is important that students are not aware that some students are working at a lower grade level.

Effective ways to differentiate the content and process are to use cooperative learning, peer tutoring, or tiered instruction (Adams & Pierce, 2004; Alison & Rehm, 2007; Guskey, 2008; Lopez & Schroeder, 2008; Rock et al., 2008; Tomlinson, 2000). Cooperative learning groups work to master the same concept or different concepts in the same way. Cooperative learning groups work well for all students as long as they are carefully put together. Groups may be created based on ability levels, interests or learning styles. Cooperative learning groups have been found to work especially well for shy students because it increases their self esteem, which then increases their achievement. Students learn a lot of life skills such as problem solving, learning to work as a team, planning and evaluating, and receiving and providing criticism (Lopez & Schroeder, 2008).

Peer tutoring is an excellent way to differentiate instruction for struggling students and the peer tutoring has been found to benefit the peer tutors as much as the student receiving the tutoring (Guskey, 2008). Tiered lessons are lessons in which you have different groups of students working together. All students are working to master the same concept, but in different ways. Some students may be in different groups because of ability levels, interests, or learning style differences. It is recommended not to use too many tiers and stick to around three (Adams & Pierce, 2004; Levy, 2008). A framework for creating tiered lessons can be found in appendix D. If cooperative grouping, peer tutoring, or tiered lessons are used and students are grouped according to their learning style, student groups should be changed up over the course of a unit, so

every student can work using their preferred style, but also be challenged to use a different style (Levy, 2008; Perini et al., 2004). It is also recommended to mix up student groups that are grouped according to ability so students can learn from each other (Levy, 2008).

In an action research project done by Lopez and Schroeder (2008), one elementary and one middle school were targeted and students were surveyed about their preferred learning style. Teachers reported the difficulty in reaching all students that have a variety of needs and not having time to teach to the individual. Over a seven month period, the teachers implemented differentiated instruction lessons that focused mostly on the students' learning style. The teachers used flexible grouping while using cooperative learning groups and tiered lessons. Performance and attitudes towards these learning strategies was measured by student surveys and assessments and teacher observations. At the end of their action research project, the teachers reported that tiered lessons and cooperative learning were the best solutions for teaching to the variety of learning styles in their classrooms. The teachers found that cooperative learning groups had a "higher academic achievement rating than the individualistic or competitive approach, especially at solving concepts and predicting" (Lopez & Schroeder, 2008).

Another example of how differentiated instruction lessons are used is to help prepare students for standardized tests. One teacher had students page through their books and indicate which lessons they have mastered and which lessons they still struggle with. She then put them into groups according to their needs and used peer tutors as the masters to help (Brimijoin et al., 2003). Another teacher uses differentiated instruction for re-teaching essential concepts. After students complete an assessment, the

students are broken up into two groups: the proficient group and the non-proficient group. The group that reached proficiency does the enrichment activity and those that did not do the corrective activity. Students who are completing the enrichment activity have a choice in what they want to do. Students in the non-proficient group are in cooperative groups and may be re-learning the concept by videos, academic games, computer activities, learning kits etc. Teachers are able to spend more time with the non-proficient group, and peer tutors are also a great resource for the non-proficient group. The student groups change after each assessment. At first, corrective and enrichment differentiated instruction does take more time, but after students see the advantage, less class time needs to be spent on it (Guskey, 2008).

Another example is a group of high school math teachers that found that fragmenting each week into teacher-led instruction, whole-class instruction and small group based on the students' abilities worked successfully at teaching math standards. The teachers worked with the small groups closely. The teachers reported that the hardest thing for them was getting used to working with the small groups on different things than the whole class was working on. The students, however, found small-group time to be a confidence booster in which they really learned a lot. Students also reported that they liked math better and their scores improved on their standardized test scores (Tomlinson, 2000).

Effective ways to differentiate the product are to use tests, verbal tests, projects, journals, demonstrations, reports, oral reports, skits, observations, experiments, graphic organizers, multimedia formats, or portfolios depending on the students ability, learning style or interest (Alison & Rehm, 2007; Anderson, 2007; Friend & Pope, 2005; Levy,

2008; Nordlund, 2003). When choosing an assessment, it is always important to remember the purpose of the assessment. Standardized testing is not always the best way to determine how well a student has mastered the content (Nordlund, 2003). An assessment should determine if the student has mastered the content and the student can often demonstrate this best if the assessment matches their ability, learning style or interests. Testing can be an appropriate assessment especially if the testing data is used from year to year to measure the growth of students (Brimijoin et al., 2003).

It is often appropriate for the student to have a variety of assessment choices. This allows the student to be engaged, have fun, and it can make connections to their lives (Tomlinson, 1999). Sometimes it is not appropriate for students to have assessment choices depending on the purpose of assessment. For example, if students are to demonstrate that they know how to create a newspaper cover, assessments may be differentiated based on ability. Gifted students can use a publisher program to create the newspaper with a lot of text and average students could have lots of pictures and little text (Friend & Pope, 2005). Assessments other than tests can have rubrics, and having students create their own rubric is an excellent way for students to be involved and responsible for their learning (Anderson, 2007; Friend & Pope, 2005).

Students create more successful assessments if their learning goals are clearly defined at the beginning of the lesson and the lessons engage students and match their learning styles, interests and abilities. Tomlinson (1999) reports about three teachers who taught the same grade and lesson. The first teacher clearly defined the learning goals and gave great lectures, worksheets and tests. It was found that there was understanding but no engagement. The second teacher differentiated instruction, but there were no

connections between the assignments, so the students were engaged but there was no understanding. The third teacher clearly defined the goals of the lesson and what everyone needed to know. She differentiated the material based on ability and interest, so the students were engaged and there was understanding.

However you choose to differentiate: the content, process or product, it is important to always remember the purpose of instruction. Nordlund states that if students are learning "how to complete a research paper, the process is more important than the content" (2003, p. 4). Sometimes the content or product is more important (Nordlund, 2003). A framework for differentiating between content, process and product based on ability can be found on appendix E.

How Does Differentiated Instruction Help Students Who Struggle With Learning?

Differentiating based on ability can help increase student achievement. This is not necessarily easy as most schools use the inclusion model which means above average, average, and below average learners are all together in one classroom. All students should feel welcome in their school and teachers should share the responsibility for their learning (Friend & Pope, 2005). As stated earlier, the diversity in classrooms can pose a challenge for teachers. Understanding each student's needs is essential in being an effective teacher. According to Marcie Nordlund's research, "a learning disability affects a person's ability to either interpret what he sees or hears, or to link information from different parts of the brain" (2003, p. 37). As teachers, we would like to think that every child can learn the entire curriculum, but when considering students with learning disabilities, emotional behavior disabilities, slow learners, and students who are English language learners, it is more realistic for these students to be successful at learning the

most important material (Nordlund, 2003). Differentiated instruction allows students to learn at their ability level (Stetson et al., 2007; Valli & Buese, 2007). When students are working at their ability level, they experience academic success, they feel confident, challenged, and they feel like each student has something to contribute (Anderson, 2007; Alison & Rehm, 2007; Friend & Pope, 2005; Lopez & Schroeder, 2008; Perini et al., 2004; Stetson et al., 2007; Tomlinson; 2000).

Challenged learners who are on an IEP (individualized education plan) often have the content, methods of instruction, and/or assessment process defined for them. Therefore, their curriculum is already differentiated. The classroom teacher is the expert in curriculum and the special education teacher is the expert in special needs methods. If a challenged learner is not on an IEP, or does not have specific methods in how to differentiate, there are a number of ways in how to differentiate that will benefit challenged learners. Instruction may be differentiated for challenged learners simply by asking challenged learners knowledge questions during discussion time instead of analysis, evaluation or synthesis questions. This allows challenged learners to feel confident (Nordlund, 2003).

Students with learning disabilities often benefit from lessons that are concrete, hands-on manipulation of objects. Abstract and paper and pencil activities are often too difficult to grasp. Many students are slow learners but are not classified with a learning disability, even though they learn approximately 85% slower than their fellow classmates. Slow learners often need to practice skills over and over and have material reinforced so it can be internalized. Shorter assignments make slower learners feel more successful (Nordlund, 2003).

Other ways to differentiate the process of learning for challenged learners are to use organizational strategies to help students, such as charts, color-coding, or sticky notes. Memory strategies that can be used include: mnemonics, categorizing, chunking, and skimming. Test taking strategies include: giving clear directions, and reminding students to check their work. Social skill strategies include: practicing conversation and listening with students and cooperative groups. Homework strategies include: planning, teaching students to follow through, and organization. Students can also be taught to understand their limitations and how to compensate for their limitations. Students must also be taught their strengths, so students can reach their full potential (Nordlund, 2003).

Students with ADD (attention deficit disorder) and ADHD (attention deficit hyperactivity disorder) have special academic needs and if lessons are slightly differentiated, students with ADD and ADHD can have more academic success. Students with ADHD and ADD should be allowed to sit however they want and be given longer time to respond to questions. Short breaks need to be allowed and a classroom with few distractions is necessary. Students need a clear routine, rules, expectations and consequences (Nordlund, 2003).

The product may be differentiated for challenged learners by giving verbal tests, shortened tests, literal levels of questions, extended time for tests, more frequent tests, a quiet place for testing, scribe for written responses, or alternative to a test. Tests, however, should not always be modified for challenged learners depending on the purpose of the test, for example you would not want to modify a test that is measuring how well a student can read (Nordlund, 2003). Alternatives to tests include: projects, journals, demonstrations, reports, oral reports, skits, observations, experiments, graphic

organizers, multimedia formats, or portfolios depending on the students ability, learning style or interest (Alison & Rehm, 2007; Anderson, 2007; Friend & Pope, 2005; Levy, 2008; Nordlund, 2003). According to Tomlinson (2000), when you are grading assessments, it is not right to give an excellent grade or an A to a student who did not need to put forth a lot of effort or learns many skills. Tomlinson (2000) believes that struggling learners deserve good grades too if they meet the goals of the class for their level.

Students struggle in classrooms for a variety of reasons not just because they have a learning disorder, behavior disorder or are slow learners. Social, economic and cultural diversity also present challenges for many students. By 2040, 40% of school aged population will have English as a second language. By 2020 almost half of school-aged population will be a race other than Caucasian even though 87% of teachers are Caucasian. Teachers therefore need to explore instructional strategies that will reach their diverse group of students. In a survey of teachers done by Alison and Rehm, teachers were asked about effective strategies for teaching multicultural and multilingual students. Teachers reported that visuals were the most effective instructional strategy; peer tutoring was the second best method, cooperative groups was third, and alternative forms of assessment was reported to be the fourth best teaching strategy (Alison & Rehm, 2007).

Visuals were found to help reinforce concepts to all students but especially for ELL (English language learners) (Alison & Rehm, 2007). Things such as posters, maps, graphs, pictures, cartoons, charts, objects, and videos work great (Alison & Rehm, 2007; Nordlund, 2003). Peer tutoring, which has already been stated as a helpful differentiated

instruction method, was found to work best when two students with different backgrounds and different academic abilities were paired up. One student is kind of like the teacher and the communication was found to be better between the students than between teacher and student. When using peer tutoring, it is important to make sure that there are clear guidelines, time is taken to make thoughtful decisions about pairing students, and that high achieving students are still having their academic needs met (Alison & Rehm, 2007).

Cooperative groups, which has also been stated as an effective differentiated instruction method, was found to be very effective for ELL students because students enhanced their communication skills and their academic performance (Alison & Rehm, 2007). The benefits of cooperative groups also are stress free for ELL students, who often find the language, not the content, stressful (Nordlund, 2003). Cooperative strategies called think-pair-share and jigsaw were found to be very effective. Think-pair-share is a method where students are given a discussion topic to think about quietly and then students are paired up in groups of two, three, or four. They are then asked to talk about the discussion topic together. Jigsaw is a method where groups are given material to master. The group then brakes up and teaches other group members about their material that they just mastered. Then the group members go back to their original group and share what they learned (Alison & Rehm, 2007).

Standardized tests are an ineffective way to assess ELL student's knowledge of a subject matter unless it is in their native language (Alison & Rehm, 2007; Nordlund, 2003). That is why the teachers' survey reported that alternative assessments (also previously stated as an effective differentiated instruction method) were very effective

when working with multicultural and multilingual students. The alternative assessments that were used were projects, demonstrations, journals, exhibitions, observations, portfolios, graphic organizers, and multimedia formats (Alison & Rehm, 2007). In fact, the "Florida middle-school teachers strongly endorsed the value and need for a variety of assessment methods to effectively and accurately evaluate the progress of multicultural and multilingual students" (Alison & Rehm, 2007, p. 15). These alternative assessments should show that the student learned the content and the teacher should accept grammatical and speaking errors (Nordlund, 2003).

In an action research project done by Valli and Buese, teachers participated in a study that lasted four years. The primary goal of the study was to learn how teachers help struggling students learn foundational skills and what strategies they use and what constraints it puts on their teaching. Teachers in schools with 30% to 80% poverty rate were invited to participate. One hundred and fifty teachers from twenty-five schools participated by allowing observations and participated in individual and group interviews. Principals were also interviewed. All the teachers were certified and teaching in their license area. Differentiated instruction was considered to be one of the main tasks that would aid the schools to meet AYP (adequate yearly progress). Teachers had control of what/how to differentiate in their classrooms and had access to special education teachers. Some of the other teaching tasks were data analysis, management of inclusion instruction, curriculum implementation, instructional planning, and student placement. In all, there were twenty five teacher tasks and they were analyzed as either instructional, institutional, collaborative, learning, or relational role, and it was also determined what

the influence was: federal, state, district, and high, low, or moderate. These tasks all had to do with differentiated instruction (Valli & Buese, 2007).

Special programs were created for low-level achieving students in math and reading and these students are removed from the classroom. Teachers spent a lot of time going over data to see who should receive special programs. A number of tests were given throughout the year to assess student's grade level standings. Using the test results, teachers mixed up their differentiated groups accordingly, and found material and new assessments for the groups. Using differentiate instruction methods worked so successfully for many schools that by the fourth year, some schools began to require differentiated instruction for a new reading program (Valli & Buese, 2007).

The results of the project showed that differentiated instruction allowed the schools to meet the needs of students working above grade level and students who needed remediation. Teachers reported both challenges and benefits to using differentiated instruction. The challenges were that teachers found it hard to stay on pace and finish their material when using differentiated instruction. Teachers felt overworked and had to take time to create a lot of curriculum and assessments. Teachers felt overwhelmed when trying to keep up with analyzing student data. Teachers also felt pressure to make AYP (Valli & Buese, 2007).

The benefits that teachers reported on included that students were working at their ability level. Teachers said that they understood their students better and felt that they were better teachers. Teachers were happy to receive staff training on differentiated instruction, and teachers found it beneficial to collaborate with other teachers working with the same students to talk about strategies to best teach their students. Teachers

reported that they became good at analyzing student data, and it was extremely helpful. Overall, the goal of the project was met and that was to help struggling students learn foundational skills and improve student achievement (Valli & Buese, 2007).

How Does Differentiated Instruction Help Gifted and Talented Students?

Struggling students are not the only students that benefit from differentiated instruction. Gifted and talented students benefit as well. According to Lee and Olszewski-Kubilus (2006), gifted and talented students often spend too much time on content they have already mastered, which makes learning boring and repetitious. Often times too much attention is given to students who are not meeting state standards, and little time is spent teaching gifted and talented students. When gifted and talented students restudy material that they already know, it decreases motivation for future and continued learning. Gifted and talented students should be excused from material they already know. When using differentiating instruction for gifted and talented students, it is critical to find out what the student already knows (Nordlund, 2003). Gifted and talented/above average ability students need more exciting work not just more work, or they will get tired and not meet their potential. Teachers should be providing gifted and talented students with fewer and more complex tasks rather than several alternative assignments. These tasks should be challenging problem situations that allow students to use inquiry to gain knowledge (Adams & Pierce, 2004; Diezmann & Watters, 2000; Nordlund, 2003).

One of the reasons that gifted and talented students need to have their instruction differentiated is because they have advanced reasoning abilities, passion for learning, rapid grasp of abstract concepts, intrinsic motivation, and advanced logical thinking.

Gifted and talented students should be working at a faster pace and taught differently than non-gifted and talented students (Lee & Olszewski-Kubilus, 2006). Lessons can be differentiated for gifted and talented students in all the ways that have previously been talked about, but gifted and talented students are often very successful working independently. That does not mean that teachers need to create different lessons for each student, but rather that these students can be doing the same thing, but independently. Learning contracts also work for gifted and talented students. The contract is between the student and the teacher. The teacher determines the content, skills, timeline and positive and negative consequences for completed and not completed work (Nordlund, 2003). Teachers can assess a student's progress by engaging the student in dialogue or question which then facilitates student learning (Diezmann & Watters, 2000).

In two different action research projects, teachers who taught gifted and talented students were assessed on their effectiveness at implementing differentiated instruction (Lee & Olszewski-Kubilius, 2006; Van-Tassel, Quek, & Feng, 2007). In the project completed by Van-Tassel, Quek and Geng, one hundred and twenty three teachers were observed and rated on their effectiveness at teaching gifted and talented students. The researchers were observing how teachers used differentiated instruction to help the students develop problem solving strategies, critical thinking strategies, creative thinking strategies, and research strategies. A rating scale was developed, and if the behaviors the teachers were trying to see when using their strategies were not demonstrated by some of the students, the teacher was given a low rating. Other observations were noted, such as how much time the teacher spent with students, the teacher's lessons/script, questions that the teacher would ask the students and the student responses, and how the teacher

interacted with the students. Pre and post tests were also given to students in order to measure achievement because of effective differentiated instruction teacher strategies. The results of the project showed that not enough emphasis was put on differentiation strategies, so therefore students had little gains in using their problem solving, critical thinking, creative thinking and research strategies. It was also determined that teachers need more professional development on differentiation strategies (Van-Tassel et al., 2007).

Similar results were seen in the action research project completed by Lee and Olszewski-Kubilius. Their project was much smaller and only involved fifteen middle school and high school teachers who were specifically selected based on their expertise and enthusiasm. These teachers were interviewed following the use of differentiated instruction with their gifted and talented students. The teachers had students doing extra work and used very few differentiated strategies. At the end of the study it was concluded that even good teachers need to be trained in the methods of differentiated instruction, so gifted and talented students can have greater academic achievement. This was considered true because students were not ability grouped and not allowed to work at their own pace (Lee & Olszewski-Kubilius, 2006).

Differentiated instruction has been found in research to be a method that meets the needs of gifted and talented students (Lee & Olszewski-Kubilus, 2006; Tomlinson, 1999; Van-Tassel et al., 2007). Differentiated instruction can allow gifted and talented students to work at their ability level and experience academic success, confidence and be challenged (Anderson, 2007; Alison & Rehm, 2007; Friend & Pope, 2005; Lopez & Schroeder, 2008; Perini et al., 2004; Stetson et al., 2007; Tomlinson; 2000). Motivation

to learn was reported by students who were involved in an action research project done by a middle school teacher. This teacher specifically targeted gifted and talented students in math. Before gifted and talented students were ability grouped to work on real life math problems, students completed a survey about their satisfaction of school. Most of the students stated that they liked school, and their motivation for completing their work was that they were told to and not because they were excited about learning. Most students did not feel challenged and wished they had more academic choices. After students were ability grouped, working at their own pace, and given some academic choices, students reported that they felt challenged, had fun, enjoyed learning and having more choices; especially when they could create things. Parents were also surveyed before and after differentiated instruction was implemented. After differentiated instruction was implemented, the parents stated that their children enjoyed school more, talked about school more, and felt challenged in school (Kondor, 2007).

What Are the Challenges of Using Differentiated Instruction?

These three action research projects that targeted how differentiated instruction affects gifted and talented students demonstrate the positives and negatives and challenges and benefits to using differentiated instruction strategies. Other research projects previously stated mentioned other obstacles to using differentiated instruction. There is no doubt that anytime a teacher tries something new there is a learning curve involved. Planning lessons using differentiated instruction takes time; just as a first year teacher or a teacher teaching a new subject takes time to plan lessons. It is recommended that teachers who are just starting to use differentiated instruction should start small by choosing only a few lessons to differentiate (Adams & Pierce, 2004; Anderson, 2007;

Nordlund, 2003). Using differentiated instruction strategies are also difficult to implement if teachers are not given proper training or given enough time to learn differentiated instruction strategies (Lee & Olszewski-Kubilius, 2006; Nordlund, 2003; Van-Tassel et al., 2007). If teachers are using standardized testing data to help create ability groups this can take additional time and be overwhelming as learning to understand data can be difficult at first (Stetson et al., 2007; Valli & Buese, 2007). In a study done by Stetson et al. (2007), teachers also found that lessons sometimes took longer to complete when using differentiated instruction, but they unanimously decided that the benefits of differentiated instruction outweighed the negatives. According to Rock et al. (2008), the research is there to back differentiated instruction, but the reason it is not used is because teachers do not feel well trained in the methods and often have too many responsibilities and a large workload. An overworked teacher is caused by many factors (Lopez & Schroeder, 2008; Valli & Buese, 2007), but teachers do have the responsibility to make sure every student in their classroom is learning and maximum academic growth is being achieved (Adams & Pierce, 2004; Lopez & Schroeder, 2008; Tomlinson, 1999, 2004).

What Are the Benefits of Using Differentiated Instruction?

There are a few misconceptions about differentiated instruction such as, students will not be prepared for standardized tests, some students will receive un-fair amounts of work, students will not know how to handle the real-world, and "it is not fair to give students credit for learning if they have not demonstrated the same knowledge as other students" (Rock et al., 2008, p. 33). The belief that students will not be prepared for standardized tests is definitely false according to research. Stetson et al. (2007) did a

study and teachers reported that students had higher scores on assessments, especially from low achieving students. An elementary teacher found that using differentiated instruction to teach the curriculum and standards found she understood the curriculum, the standards and the students better. She found it was easy to integrate the standards and the curriculum with differentiated instruction (Tomlinson, 2000). Another example of how students benefit from differentiated instruction is two teachers involved in a study on differentiated instruction reported that they saw changes in all of their students, especially changes in students with IEPs. These teachers saw few behavioral disruptions, increased work completion, less absenteeism, and higher scores on state tests (Rock et al., 2008). A number of other studies have shown that the academic benefits of differentiated instruction have been seen over and over (Anderson, 2007; Cusumano & Mueller, 2007; Lopez & Schroeder, 2008).

As far as the misconception that some students will receive unfair amounts of work goes, this is false because as previously stated differentiated instruction strategies say specifically not to have a group of students doing a bunch of extra work or busy work. Students who need to be challenged should not be receiving extra work, but more challenging work (Adams & Pierce, 2004; Diezmann & Watters, 2000; Nordlund, 2003). It has also been stated about the importance of students working at their ability level. Numerous studies show that teachers who use differentiated instruction report that students are working to their ability level and appropriately challenged (Stetson et al., 2007; Valli & Buese, 2007). When students are working at their ability level, they experience academic success, they feel confident, challenged, and they feel like they have something to contribute (Anderson, 2007; Alison & Rehm, 2007; Friend & Pope, 2005;

Lopez & Schroeder, 2008; Perini et al., 2004; Stetson et al., 2007; Tomlinson; 2000). The misconception that students will not know how to handle the real world is false, because as previously stated students need to understand their strengths and weaknesses so they can reach their full academic potential (Nordlund, 2003).

No matter how good a teaching strategy sounds, teachers and students have to see and feel the benefits or a specific method will not be continued to be used. Valli and Buese (2007) report that the teachers in their action research project felt that they understood their students better and they felt like they were better teachers. Teachers have also reported that students enjoyed learning, students were engaged, (Delaney & Shafer, 2007; Perini et al., 2004; Stetson et al., 2007) students were motivated, engaged, showed interest, and students had higher energy (Lopez & Schroeder, 2008; Stetson et al., 2007). Stetson et al. (2007) completed an action research project and reported on additional benefits such as the quality of student work improved, and students felt like learning was relevant to life. Teachers have also found that students who work in cooperative groups are more likely to share what they learned and feel comfortable communicating (Alison & Rehm, 2007; Stetson et al., 2007). It has also been reported that when students are working in cooperative groups, teachers had more time to work with individual students (Stetson et al., 2007). Delaney and Shafer (2007) completed an action research project and the students were surveyed on their experience with differentiated instruction and they reported that they had fun, it was humorous, and it increased their learning and helped their memory. Lopez and Schroeder (2008) completed an action research project and found that differentiated instruction strategies led to higher academic success and higher grades. Academic success and higher grades

led to students having higher self esteem and a positive environment in the classroom. When students experience all of these positive things because of differentiated instruction, teachers are then meeting the needs of all their students and providing students with a positive learning experience.

Chapter 3: Summary

In conclusion, the literature states and I believe that it is a teacher's responsibility to ensure that every student in your classroom is learning and reaching their academic potential. I believe that this is not always an easy task because of the diverse group of students that we teach every day. Based on the literature, differentiated instruction is one way to ensure that every student is learning and reaching their academic potential.

I became interested in this topic because I struggled with how to effectively reach students in my classroom who struggle and at the same time reach students in my classroom who are always achieving above and beyond. I teach seventh grade Life Science and a senior high science class called Outdoor Science, which is a class of mostly juniors and some sophomores and seniors. The socio-economic and academic status of the student population is very diverse. In my seventh grade Life Science class, I have every student in the seventh grade that is on an IEP. Science is the only mainstream class that some of these students have. A few of the students on IEP's have a paraprofessional teacher with them to help them, but I am responsible for their learning. These students are in the same class as gifted and talented students. Some schools offer advanced and lower level science classes, but my school population is too small to offer such classes.

In my Outdoor Science class, I also have a variety of learners. In our school, students need to take three years of high school science. Students are required to take Physical Science and Biology and they get to choose their third science class. Their choices are between Chemistry, Physics, Anatomy and my Outdoor Science class. In our School, our Chemistry, Physics and Anatomy classes are all college prep classes and students can also earn college credit in these classes. So, the students who take my

Outdoor Science class are either non-college bound students, or students who are interested in the environment. So again, I have a wide variety of learners in my classroom with a wide variety of motivation.

I believe that because of my research I now have the tools to effectively use differentiated instruction strategies. I understand that the content, process or product can be differentiated according to the student's ability, learning style or interest. I have read about the challenges and I believe they can be overcome if differentiated instruction is implemented correctly and slowly over time. Throughout all my research I have read about so many benefits that make choosing the use of differentiated instruction to seem like a no brainer. Students working at their ability level have higher academic achievement, which then leads to students who have higher self esteem, are engaged, and happy and excited to come to school each day. Students who are enthusiastic and motivated about school are fun and easy to work with.

I began this research paper last summer, so I have already implemented some differentiated lessons into both my seventh grade Life Science and senior high Outdoor Science classes this past school year. I found using differentiated lessons to be a successful technique in my Outdoor Science. My Outdoor Science class is mostly a project based class with few tests. We are outside as much as possible doing our projects. My favorite, the students' favorite and longest project in the class is our aquatics unit. We spend time learning about the physical, chemical and biological properties of freshwater systems in Minnesota. Everyone is taught the same content. We then walk to a nearby lake about ten times during the spring, and we test and record the physical, chemical and biological properties of the lake. Students are ability/interest grouped and

each group is responsible for collecting some form of data and sharing their findings with the rest of the class. The students who take the class because they are interested, but who are also taking or have taken chemistry class complete some of the chemical analysis that is more difficult, such as the dissolved oxygen titration (we do not have a dissolved oxygen meter). Students who are more interested in the biology aspect are in charge of collecting and identifying macroinvertebrates. There are five main types of data that we collect each time we go to the lake and I require each group to try each one once so they are exposed to all aspects of the data collection. In three years, I have never had a group complain about the way that groups are created or how much work each group is responsible for.

Their assessment of the project is a paper that contains the data, graphs, analysis of the data etc. The students who have an interest in going into environmental fields or the students who excel because of their chemistry or physics background or prior knowledge are graded harder on their analysis, synthesis, and evaluation of the data while the other students are graded harder on their organization of the paper and their basic knowledge and understanding of the data. Students are told individually about my expectations of their papers. Again, students have never complained about the differentiation. In fact, at the end of the year, I have always had students thank me for having them work at their ability level. When the students were working at their ability level they found academic success, which in turn motivated them to work hard on future projects and enjoy my class. Students who enjoy my class are fun to teach and work with. I also use ability and interest grouping and alternative assessments for other

projects throughout the year during our forestry, soils, arthropod, fish, and mammals units.

In seventh grade Life Science, I have found that I have to be a little more discreet about ability grouping students. Students in seventh grade seem to be a little more sensitive about others knowing what they are working on. I do spend a lot of time during the year reviewing student's standardized test scores in reading and math to determine ability levels. By next year, I will also be able to review the student's standardized test scores from their Science MCA's (Minnesota Comprehensive Assessment). I have explained to the students that at certain times of the year different groups of students will be receiving different types of assignments so they can all be appropriately challenged. I use a sports analogy to help them understand. I asked them if everyone on their sports team is equally as talented. They all reply no. I asked them how each person on the team can get better no matter their ability level, and they reply by practicing. I asked them if one person is excellent at shooting free throws, but needs improvement in dribbling should they continue to work on free throws but not dribbling. They all replied that they should work on dribbling. I also asked them that if someone cannot dribble the ball in place should they work on that or dribbling while running. They all reply that they should work on dribbling in place first. I then explain that school is the same way. If someone has already mastered something in science class; they should not keep on working on it, but rather they should work on something more challenging. I also tell them that if someone has not mastered a concept in Science they should not be working on more challenging concepts. All students seem to understand it then, but I have to

constantly remind students of this throughout the year. I am also still discreet when I use differentiated lessons.

I have successfully differentiated the product on a number of different assessments throughout last year in ways that the literature suggests. Our science book comes with two ability levels: low and average; for worksheets, labs and tests. There are also enrichment worksheets. I have used the worksheets for lower level students, average students, and the enrichment worksheets. I have used these only as homework assignments, and I remind students of the importance of properly challenging all students so they can reach their academic potential. I have not had students do different labs yet, but I have used the book's two different sets of lab conclusion questions for low and average ability students. These lab questions checks for knowledge and understanding, and the average set of questions also check for some application and analysis. I have also created lab questions for my high ability students. These students do not get more questions, but rather more challenging questions that require them to use their inquiry, analysis, synthesis and evaluation skills. I have found this to work extremely well and there is very little talk about who is completing the different types of questions.

I have already differentiated the product according to interest during a few projects throughout the year, which is one way the literature suggests to use differentiated instruction. For example, at the end of our environmental unit students complete a project. Students are given project topics to choose from and project assessments to choose from. All students are given the same rubric, so they all have to complete the same requirements, but on a topic that they are interested in. They also get to choose a type of project according to their interest, which include a letter to the editor, designing a

poster or cereal box, or creating a commercial. Students end up choosing a project that matches their learning style, even though they may not realize it.

Next year, I plan on giving my seventh grade Life Science students the multiple intelligence survey and then teach them about the different learning styles. Through my research, I learned about the multiple intelligence survey and the literature suggests that it is important for students to know their strengths and weaknesses. I also found in the literature that it is important for students to have opportunities to excel while using their learning style strengths, but also challenge themselves and learn by using their learning style weaknesses. I would then like students to learn using their learning style, and I would create groups that have similar learning styles. I would have each group learn a particular lesson in a different way and have everyone in the class complete the same assessment. From my research, I learned that this method is called a tired lesson, and it is recommended to not have more than three tiers. I might have one group reading about how matter is cycled through the earth and then have them write a summary. I might have another group learn about it by looking at diagrams and then draw their own. I might have another group watch a video on it and then act out the process in front of their classmates. I also would like to have students of all learning styles work in cooperative groups where they are learning the same content, such as a lab, and in the lab they would use their preferred learning style to help with the lab. I could have one student be the writer, one person conduct the experiment, another person creates a data table and graph, and another person reports their findings to the class.

I would also like to differentiate the content and process according to ability levels this coming school year. This is another method that the literature suggests is an

effective way to use differentiated instruction. One method that I learned from research is how to use pre-tests and create enrichment work for high achieving students. I would like to use pre-tests for a few different units that the students have learned about in previous science classes. The literature suggests that the students that are proficient would then be given an independent project or lab experiment to complete, and that these students be given more challenging work: not just more work. From my research I learned that a contract could be used for them to complete a research project, for example, on genetics if they have demonstrated proficiency in punnett squares and how traits are inherited. If a student has demonstrated proficiency in understanding photosynthesis, then they would be assigned to complete an experiment that tested a hypothesis that the student(s) created on the topic of photosynthesis.

I would also like to use differentiated lessons to review concepts previously learned throughout the school year, which the literature states is another way to use differentiated instruction. Before the semester one and semester two final tests, we spend a lot of time reviewing for these tests (that our school district mandates us to give). I would like to have students work in cooperative groups to review the concepts that they struggle with. I would determine the areas that they struggle with by grading their study guide. If there are students who do not struggle with any of the concepts, then they would be given an enrichment activity. According to my research, students who are forced to work on content they have already mastered begin to think school is boring and they are less motivated for future learning. I do not want that to happen.

I believe differentiating the content and process for gifted and challenged learners will be easier than differentiating the content and process for lower ability students. I

believe this because every student in seventh grade Life Science class has to learn the Minnesota standards so they are prepared for the MCA Science test in eighth grade. Therefore, every student is expected to learn all of the standards/content that I teach. I do not necessarily agree with the fact that every student needs to have a complete understanding of the numerous Life Science standards, but the science units I teach are based on the Minnesota life science standards. I believe that many students would feel academic success, confidence, and motivation for future learning if they were learning at their ability level instead of learning all the state standards; many of which they do not understand. I believe these students would then enjoy school more and have academic success in the future. The literature states this to be true.

This would then mean that some lower ability students would not be taught some of the standards that state will be testing them on. For example, many students struggle with understanding cellular respiration, which is one of our standards in seventh grade Life Science. I could use ability grouping and just teach the lower level students that cells need energy and plants get their energy from the food they make and animals get energy from the food they eat. The students would understand this, but they would never learn the cellular respiration equation or understand where and how this happens in the cell. The literature suggests that this is the biggest controversy of using differentiated instruction. The literature on differentiated instruction states that all students should be learning at their ability level, which is contrary to what the state tests suggests. These tests state that all students have to learn all of the standards for their grade level and subject. I have found in my research that lower ability students often benefit the most from differentiated instruction and have been found to perform higher on state

standardized tests, have fewer behavior problems, increased work completion, and confidence. So what is more important: to teach students every state standard or to have students learning at their ability level and their own pace so they can experience academic success, motivation and confidence?

I am excited to use more differentiated instruction in the future years. I have learned from the literature that differentiating lessons is essential to students reaching their academic potential, which increases their motivation and enjoyment for school. I believe I am capable of differentiating lessons according to content, process, product, ability, interest, and learning style quite easily if I develop differentiated lessons over time. Based on my experience, I believe that differentiating the content for my lower level students will be my biggest challenge, because I will have a hard time not teaching them concepts they are expected to know about according to state standards. The literature states and I believe that it is my responsibility to make sure all students are learning and reaching their academic potential and, differentiated instruction is one method to ensure that this happens. The summary of each of my references can be found in appendix A.

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Rock, M. L., Gregg, M., Ellis, E., & Gable, R. A. (2008). Reach: A framework for differentiating classroom instruction. *Preventing School Failure, 52*(2), 31-47. Retrieved July 23, 2008, from Academic Search Premier database.

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VanTassel-Baska, J., Quek, C., & Feng, A. X. (2007). The development and use of a structured teacher observation scale to assess differentiated best practice. *Roeper Review, 29*(2), 84-92. Retrieved July 18, 2008, from Sage Full Text Collections database.

Appendix A. Annotated Bibliography on Differentiated Instruction

Adams, C. M., & Pierce, R. L. (2004). Tiered lessons: One way to differentiate mathematics instruction. *Gifted Child Today, 27*(2), 58-65. Retrieved July 18, 2008, from ERIC database.

The authors define what differentiated instruction is, the variety of ways it can be used, how to implement differentiated instruction into your classroom, and it goes into detail and gives examples of creating differentiated lessons. Tiered lessons are described to be an essential strategy when using differentiated instruction. Tiered lessons are lessons in which you have different groups of students working together to master the same concept but in different ways. Some students may be in different groups because of ability, learning style differences, or interests. You may have as little as two tiers and as many as you can handle or see needed. It is suggested to start with just one concept, lesson, or unit and have no more than three tiers to start out.

Allison B., & Rehm M. (2007). Effective teaching strategies for middle school learners in multicultural, multilingual classrooms. *Middle School Journal, 39*(2), 12-18.

Sixteen teachers across seven different districts in urban and rural Florida were surveyed on what strategies they found effective for teaching multicultural and multilingual students. There were four strategies that all teachers agreed upon. The use of visuals in the classroom was found to help reinforce concepts especially for English Language Learners. Peer tutoring was found effective when pairing two students with different backgrounds and different academic abilities. Cooperative learning groups and a variety of cooperative strategies reached all types of learners and allowed students of all backgrounds to feel comfortable sharing in their small group. The last effective strategy was to offer alternative modes of assessment so each very different learner could be successful.

Anderson, K. M. (2007). Tips for teaching: Differentiating instruction to include all students. *Preventing School Failure, 51*(3), 49-54. Retrieved July 23, 2008, from Academic Search Premier database.

The author describes how differentiated instruction can be used to meet the needs of all students in very diverse classrooms and meet state and federal standards at the same time. The author describes the importance to be flexible, creative, and use on-going assessments to determine students understanding of content. The author states that teachers do no need to lower their expectations for certain students, but rather differentiate the content. Ways to differentiate the process and product/assessment are also described with examples. Teachers can differentiate based on ability or learning styles. Differentiated instruction not only aids students to master content and achieve state standards, but also to be actively involved in their own learning process.

Benjamin, A. (2006). Valuing differentiated instruction. *The Education Digest, 72*(1), 57-59. Retrieved July 18, 2008, from ERIC database.

The author describes the importance of deciding on the "what" or content of teaching, but then determining the "how" of teaching. The how is what should be differentiated. The author also described the importance of students having a secure daily routine, because some students do not like change. The author described the importance of assessments being differentiated, but the routine should not. The author also described that variety of assessments can bring excitement to learning, and a lot of students look forward to choices and different assessments.

Brimijoin, K., Marquissee, E., & Tomlinson, C. A. (2003). Using data to differentiate instruction. *Educational Leadership, 60*(5), 70-74. Retrieved July 23, 2008, from Academic Search Premier database.

The authors describe a how to use data to differentiate instruction. The authors describe the importance of explaining to a class at the beginning of the year that student data from standardized tests will sometimes determine the groups that they work in. The teachers that do this found that students do not question the groupings at all, or complain about each groups different assignments. The authors describe how data can be used for pre-assessment and on-going assessment. Many examples are given for pre-assessments. An example of a teacher that uses data and differentiated instruction is given. This teacher keeps track of improvements over the course of a year by looking at standardized tests, and attributes pre-assessment, self-assessment, on going assessment, and differentiated instruction to her students' improvements.

Carolan, J., & Guinn, A. (2007). Differentiation: Lessons from master teachers. *Educational Leadership, 645*, 44-47. Retrieved June 26, 2008, from ERIC database.

Five middle school teachers, who are considered to be excellent educators, from different schools in San Francisco, California were observed and interviewed for more than thirty-five hours. These teachers were observed and interviewed to see what it is that they were doing exceptionally well in their classrooms. It was found that these teachers had four things in common. They defined clear learning goals for each lesson, but allowed students to demonstrate what they knew in multiple ways, which is differentiated instruction. They offered one on one time for personalized scaffolding, which are supports that help bridge the gap between what the students can do and what they need to be able to learn or do. They matched their content to different learning styles during different lessons, and they created a caring classroom.

Cusumano, C., & Mueller, J. (2007). How differentiated instruction helps struggling students. *Leadership, 6*(4), 8-10. Retrieved June 26, 2008, from ERIC database.

The authors describe how Holland Elementary School in Fresno California made a goal to improve their student achievement. They succeeded in student improvement by creating an after school program, summer programs and using differentiated instruction after a six year period. Teachers who taught core subjects in all of the elementary grades were given training on differentiated instruction, time to collaborate with their team, specific training for effective reading and math programs, and training on analyzing student assessment data. Teachers used differentiated instruction by creating small groups based on student needs. These groups changed with each new lesson. Teachers monitored their progress and checked for understanding very frequently. Differentiated instruction, along with other new programs, provided the tools to improve student achievement and make AYP in all areas and all grades, which had never been done before.

Delaney, C., & Shafer, F. K. (2007). Teaching to multiple intelligences by following a "slime trail". *Middle School Journal, 39*(1), 38-43.

The authors describe a group of teachers from Southern Illinois who planned and taught lessons designed in consideration of Gardner's eight multiple intelligences. Students possess all eight levels of Gardner's multiple intelligences, but function best using a few of them. Students completed the multiple intelligences assessment scale so students and their teachers could understand their strengths. Teachers allowed students to choose their strongest multiple intelligence group to demonstrate a content standard. Students are teachers were surveyed at the end of the lesson and positive feedback was given by the teachers and over 100 students. Only two student comments were negative concerning not having enough time.

Diezmann, C., & Watters, J. (2000). Catering for mathematically gifted elementary students: Learning from challenged tasks. *Gifted Child Today, 23*(4), 14-19. Retrieved July 7, 2009, from ERIC database.

The authors describe how students who are gifted and talented at math need to be challenged in the classroom. The author describes the role of the teacher and methods in which gifted and talented students learn best. The authors suggest giving gifted and talented students fewer and more complex tasks rather than a bunch of alternative assignments. These tasks should be real life problems that allow the students to use inquiry to gain knowledge.

Friend, M., & Pope, K. (2005). Creating schools in which all students can succeed. *Kappa Delta Pi Record, 41*(2), 56-61. Retrieved July 18, 2008, from ERIC database.

The authors describe the fast changing look of America's classrooms because of increased diversity of students, and high emphasis on testing and teacher accountability. These changes in classrooms then mean that changes in instruction need to occur. The authors describe two strategies to meet the needs of all students in the classroom which include teacher collaboration and differentiated instruction. Differentiated instruction is said not to mean teachers create individual lessons for each student, but rather it is a way of thinking about teaching based on the fact that students are diverse with a lot of different needs and ability levels. The authors describe differentiated instruction steps, and suggest starting with one lesson or activity.

Guskey, T. R. (2008). The rest of the story. *Educational Leadership, 65*(4), 28-35. Retrieved July 18, 2008, from ERIC database.

The author describes the importance and describes strategies to re-teach content/concepts to students who were not proficient in the content after a formative assessment. He also describes the importance and describes enrichment activities for students who were proficient in the content after a formative assessment. He found that the same strategies worked for both groups (that do change after each lesson). He describes cooperative teams and peer tutoring to work the best, but that it is essential for the instruction to be different that what was previously learned about that content. He lists a variety of different lessons to try, and describes the importance in letting students be able to choose.

Kondor, C. A. (2007). *One size may not fit all, but the right teaching strategies might: The effects of differentiated instruction on the motivation of talented and gifted students* (Master's thesis, Portland State University). Retrieved July 6, 2009, from ERIC database.

An action research project was done where students and parents were surveyed about the effects of differentiated instruction on student's learning. Students were ability grouped in math and given more academic choices. Students were given real life problems to solve. The parents and students reported that the students felt more challenged, enjoyed school more, and completed their work because they wanted to learn not just because they had to; like the reported previously.

Lee, S., & Olszewski-kubilius, P. (2006). A study of instructional methods used in fast-paced classes. *Gifted Child Quarterly, 50*(3), 216-237. Retrieved July 18, 2008, from Sage Full Text Collections database.

Fifteen secondary teachers who teach gifted and talented classes for three weeks a summer and regular education classes during the school year were interviewed

and asked to complete surveys about how they differentiated their curriculum and instruction during a 3 week fast-paced class for gifted and talented students compared to their instruction and curriculum during their school year courses. The author describes a lot of research that indicates that teachers who use differentiated instruction and curriculum while teaching gifted and talented students have gifted and talented students that have great academic achievement than the rather. In the study in the article, it was found that half of the teachers differentiated their instruction and curriculum when teaching gifted and talented students in the three week summer program, and half did not. The reason for differentiating instruction and curriculum was to meet the needs of the gifted and talented students and time constraints.

Levy, H. M. (2008). Meeting the needs of all students through differentiated instruction: Helping every child reach and exceed standards. *Clearing House: A Journal of Educational Strategies, Issues and Ideas, 81*(4), 161-164. Retrieved July 23, 2008, from Academic Search Premier database.

The author describes the fact that teachers teach a very diverse group of students, who have the large task of having to pass standardized tests in order to determine if they have mastered the content. The author describes that differentiated instruction is one way to meet the needs of all learners. The author states that teachers need to be flexible and use differentiated instruction for content, process, or product/assessment depending on the students' abilities or learning styles. Ability can be determined by test data, pre-tests, or methods such as KWL. Learning styles can be assessed by a questionnaire. The author describes how students can go about grouping their students according to their abilities and learning styles, but also mixing students up so they can learn from each other.

Lopez, D. M., & Schroeder, L. (2008). *Designing strategies that meet the variety of learning styles of students* (Master's research project, Saint Xavier University). Retrieved July 18, 2008, from ERIC database.

The authors of this research paper completed an action research project in two schools. School A is an elementary school in a small town in the Midwest. School B is middle school in a metro area in the Midwest. The project was to identify students learning styles by the use of student surveys, and teachers were given a variety of teaching strategies to use to meet the needs of all students in the classroom. Teachers made weekly observations and used a variety of assessments to measure the student's academic success. After the seven month study, the teachers in the study found that differentiated instruction, cooperative learning groups, and tiered instruction led to academic success and higher grades were achieved. Students also felt empowered to know their learning style, had higher self esteem, fewer missing assignments, and a positive atmosphere was created in the classroom.

Neill, M., Guisbond, L., & Schaeffer, B. (2004). *Failing our children: The national center for fair and open testing*. Retrieved July 23, 2008, from http://www.fairtest.org/Failing_Our_Children_Report.html

The authors of this article report on the No Child Left Behind (NCLB) Act that is not working properly to help our nation's children. This article talks about what NCLB has promised and the harm it is causing to our nation's schools, teachers and students, because of the high pressure put on standardized tests and the lack of funding for schools. In the article it states that only 30% of students with IEP's (individualized education programs) were proficient in reading and math, and 26% of schools did not make AYP (adequate yearly progress). There are six million students with IEP's, so therefore four million (70%) lack proficiency in math and reading.

Norlund, M. (2003). *Differentiated instruction: Meeting the educational needs of all students in your classroom*. Lanham, MD: Rowman & Littlefield Publishing Group, Inc.

The author describes the importance of using differentiated instruction at all levels of schooling, because teachers have very diverse students altogether in the same classroom. The author uses her years of teaching experience and research on differentiated instruction to guide teachers in how to implement differentiated instruction. The author provides examples of how to use differentiated instruction when instructing students with cultural and language differences, students with learning disabilities, students described as slow learners, students with above average abilities, and students at risk of school failure. The book is filled with numerous easy to understand data tables that contain different teaching strategies to use with students with a variety of needs.

Office of Special Education and Rehabilitative Services. (2004). *Twenty-sixth annual report to congress on the implementation of the individuals with Disabilities Education Act*. Washington, DC: U.S. Department of Education. Retrieved August 4, 2008, from ERIC database.

This report focuses on children and students ages one to twenty-one that are served under IDEA, implementation of the individuals with disabilities act. The report has state performance data and states are compared on their programs, student achievement, dropout rates etc. In the report it states that 96% of general education teachers have students with learning disabilities in their classrooms.

Perini, M., Strong, R., & Thomas, E. (2004). Creating a differentiated mathematics classroom. *Educational Leadership, 61*(5), 73-78. Retrieved July 18, 2008, from ERIC database.

The authors describe how to combine two popular differentiated instruction approaches by Robert Marzano and Carl Ann Tomlinson. The authors describe

the importance of defining clear content standards, but considering the student's interests, prior knowledge and learning styles when offering assessment choices. The authors describe the importance of students knowing their learning styles, their learning strengths and weaknesses. The authors describe differentiated instruction strategies, and the importance of creating a differentiated classroom environment that creates a positive community, encourages all learners to feel confident in their learning style and know that every student has something to contribute.

Rock, M. L., Gregg, M., Ellis, E., & Gable, R. A. (2008). Reach: A framework for differentiating classroom instruction. *Preventing School Failure, 52*(2), 31-47. Retrieved July 23, 2008, from Academic Search Premier database.

The authors describe how diverse classrooms are today and how students have a variety of backgrounds, experiences and needs. The author describes how differentiated instruction is an instructional strategy that can be used to meet the needs of all students. The authors describe their extensive research on differentiated instruction; the evidence, the models, and the myth. From their research they developed a blueprint for differentiated instruction called REACH, which stands for "reflect on will and skill, evaluate the classroom, analyze the learners, craft research-based lessons, and hone in on the data." The authors describe success stories of teachers who tried using their REACH blueprint.

Statewide Parent Advocacy Network. (2009). *Multiple intelligence survey*. Retrieved June 4, 2009, from http://www.spannj.org/BasicRights/appendix_b.htm

This 30 question true and false test assesses a student's multiple intelligence strengths and weaknesses. This multiple intelligence test can help a teacher determine what type of learners each of their students are. Teachers can then differentiate their instruction and assessment to best match their student's learning style.

Stetson, R., Stetson, E., & Anderson, K. (2007). Differentiated instruction, from teachers' experiences. *School Administrator, 64*(8), 28. Retrieved July 18, 2008, from ERIC database.

Forty-eight elementary teachers met five times during a semester to learn instructional strategies for using differentiated instruction and each teacher taught 4 differentiated lessons. Teachers also differentiated to meet the needs of learning styles, interests, and learning environment preferences. The following are some of the benefits of using differentiated instruction that the teachers unanimously agreed on: Students were motivated, showed interest, enjoyed learning, had higher energy, were appropriately challenged, worked at their ability level, quality of work improved, higher assessment scores, and students felt comfortable. The teachers also found some challenges when using differentiated instruction such as: feeling overwhelmed to learn about differentiated instruction and develop lessons

and assessments, finding planning time, and some lessons took longer to complete. Even though the teachers identified challenges, they unanimously agreed that the benefits outweighed the negatives.

Strenberg, R., & Zhang, L. (2005). Styles of thinking as a basis of differentiated instruction. *Theory Into Practice, 44*(3), 245-253. Retrieved June 26, 2008, from ERIC database.

The authors describe the importance for teachers to help students determine their thinking styles. Thinking styles are preferences and not abilities. There are four thinking styles entitled legislative, which is the kind of student that likes to determine what and how to do things instead of being told, judicial, which is the type of student that likes to evaluate ideas, projects etc, and executive, which is the type of student that prefers to be told what to do and will do their best at the tasks given. The authors describe instructional strategies and assessments that will best fit the students thinking styles.

Tomlinson, C. (1999). Mapping a route toward differentiated instruction. *Educational Leadership, 57*(1), 12-16. Retrieved July 23, 2008, from Academic Search Premier database.

The author describes that "successful teaching requires two elements: student understanding and student engagement." This article gives three examples of teachers that taught the same grade and lesson. The first teacher has a clear understanding of the goals of the lesson and gives great lectures, worksheets and study guides, but there is no engagement. The second teacher differentiates instruction but there are no connections between the assignments, so the students are engaged but there is no understanding. The third teacher clearly defines the goals of the lesson and what everyone needs to know. How the students learn the material is differentiated based on needs and interests.

Tomlinson, C. (2000). Reconcilable differences? Standards-based teaching and differentiation. *Educational Leadership, 58*(1), 6-12. Retrieved July 23, 2008, from Academic Search Premier database.

The author describes some success stories of teachers who have used differentiated instruction. The teachers used a variety of different methods to differentiate instruction for elementary and high school students. All the teachers had state-mandated standards to teach and all found that if they incorporated the standards into the curriculum instead of letting the standards be the curriculum they found success. Teachers used methods such as ability grouping, grouping according to interest, grouping according to learning styles, and scaffolding. All teachers found that by using differentiated instruction they knew their curriculum and students better. All teachers found that students work best when the curriculum and their interest match, when they are challenged and when their classroom has a sense of community.

Tomlinson, C. (2004). Sharing responsibility for differentiating instruction. *Roper Review, 26*(4), 188. Retrieved July 23, 2008, from Academic Search Premier database.

The author describes differentiated instruction is a process where the teacher matches the learning objectives, how the student learns and how the student demonstrates what they have learned to the student's ability level, interests and learning styles. The author also describes that teachers have responsibilities to uphold that a student is learning. Students have the responsibility to ask for help, take charge of their learning, and want to make good things happen. While doing group activities each student has a responsibility to work with one another and help each other out like on a sports team.

Valli, L., & Buese, D. (2007). The changing roles of teachers in an era of high-stakes accountability. *American Educational Research Journal, 44*(3), 519-558. Retrieved July 14, 2008, from Sage Full Text Collections database.

From 2001-2005 with 150 teachers from 25 schools with a 30% to 80% poverty rate participated in a four year study to learn how teachers help struggling students learn foundational skills, what strategies they use, and what constraints it puts on their teaching. The 150 teachers, plus principals and education specialists were interview, and observed. Teachers were directed by their administration to try new teaching strategies so student achievement could be improved and AYP (adequate yearly progress) could be met in their school. Teachers spent countless hours analyzing data, learning new curriculum, and using differentiated instruction as their main new teaching strategy. Teachers liked differentiated instruction but found with all of the new information and pressures put on them to meet AYP too unbearable to handle, so differentiated instruction turned out to be too much work.

VanTassel-Baska, J., Quek, C., & Feng, A. X. (2007). The development and use of a structured teacher observation scale to assess differentiated best practice. *Roeper Review, 29*(2), 84-92. Retrieved July 18, 2008, from Sage Full Text Collections database.

The authors describe a study that was done on fifty teachers in one school, and seventy-three classrooms that were visited by twenty-three observers in another school during the fall of 2003 and the spring of 2004. The goal of the study was to observe teachers to see if they were effectively using differentiated instruction when instructing gifted learners. The authors describe in their literature review that differentiated instruction is a key instructional strategy when teaching gifted students. An extensive observation scale was created and six main areas were the focus of the observations. A rating scale was developed and the reliability of the ratings was studied. The results of the study indicated that not enough emphasis was put on differentiation strategies. It was indicated by the authors that teachers

need more professional development on differentiation strategies to effectively instruct gifted learners.

Appendix B. Multiple Intelligence Test for Students

MULTIPLE INTELLIGENCES TEST

Where does your true intelligence lie? This quiz will tell you where you stand and what to do about it. Read each statement. If it expresses some characteristic of yours and sounds true for the most part, jot down a "T." If it doesn't, mark an "F." If the statement is sometimes true, sometimes false, leave it blank.

1. _____ I'd rather draw a map than give someone verbal directions.
2. _____ I can play (or used to play) a musical instrument.
3. _____ I can associate music with my moods.
4. _____ I can add or multiply in my head.
5. _____ I like to work with calculators and computers.
6. _____ I pick up new dance steps fast.
7. _____ It's easy for me to say what I think in an argument or debate.
8. _____ I enjoy a good lecture, speech or sermon.
9. _____ I always know north from south no matter where I am.
10. _____ Life seems empty without music.
11. _____ I always understand the directions that come with new gadgets or appliances.
12. _____ I like to work puzzles and play games.
13. _____ Learning to ride a bike (or skates) was easy.
14. _____ I am irritated when I hear an argument or statement that sounds illogical.
15. _____ My sense of balance and coordination is good.
16. _____ I often see patterns and relationships between numbers faster and easier than others.
17. _____ I enjoy building models (or sculpting).
18. _____ I'm good at finding the fine points of word meanings.

19. _____ I can look at an object one way and see it sideways or backwards just as easy.

20. _____ I often connect a piece of music with some event in my life.

21. _____ I like to work with numbers and figures.

22. _____ Just looking at shapes of buildings and structures is pleasurable to me.

23. _____ I like to hum, whistle and sing in the shower or when I'm alone.

24. _____ I'm good at athletics.

25. _____ I'd like to study the structure and logic of languages.

26. _____ I'm usually aware of the expression on my face.

27. _____ I'm sensitive to the expressions on other people's faces.

28. _____ I stay "in touch" with my moods. I have no trouble identifying them.

29. _____ I am sensitive to the moods of others.

30. _____ I have a good sense of what others think of me.

MULTIPLE INTELLIGENCE SCORING SHEET

Place a check mark by each item you marked as "true." Add your totals. A total of four in any of the categories A through E indicates strong ability. In categories F and G a score of one or more means you have abilities as well.

	A	B	C	D	E	F	G
	Linguistic	Logical-Mathematical	Musical	Spatial	Bodily-Kinesthetic	Intra-personal	Inter-personal
	7 ___	4 ___	2 ___	1 ___	6 ___	26 ___	27 ___
	8 ___	5 ___	3 ___	9 ___	13 ___	28 ___	29 ___
	14___	12 ___	10 ___	11___	15 ___		30 ___
	18 ___	16 ___	20 ___	19___	17 ___		
	25 ___	21 ___	23 ___	22___	24 ___		
Totals:	____	____	____	____	____	____	____

Statewide Parent Advocacy Network. (2009). *Multiple intelligence survey*. Retrieved June 4, 2009, from http://www.spannj.org/BasicRights/appendix_b.htm

Appendix C. KWL Table

KWL Table

What I KNOW	What I WANT to know	What I LEARNED

Retrieved from http://www.squires.fcps.net/library/research/kwl.htm

Appendix D. A Framework for Creating a Tiered Differentiated Lesson

Grade:
Standard:
Concept:
Student Background Needed:
Tier I:
Tier II:
Tier III:
Assessment:

Adams, C. M., & Pierce, R. L. (2004). Tiered lessons: One way to differentiate mathematics instruction. *Gifted Child Today, 27*(2), 58-65. Retrieved July 18, 2008, from ERIC database.

Appendix E. A Framework for Differentiating between Content Process and Product

	Challenged	Average	Gifted
Content (What)			
Process (How)			
Product (Evaluation)			

Norlund, M. (2003). *Differentiated instruction: Meeting the educational needs of all students in your classroom*. Lanham, MD: Rowman & Littlefield Publishing Group, Inc.