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The impact of differentiation strategies on student achievement

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Abstract

The strategies of differentiation are of current interest to educators. With increasing pressures of No Child Left Behind educators are often left wondering if individual instruction is the best instructional practice. The extent to which these strategies impact student learning is also controversial. Differentiation can be time consuming and tedious on educators. This paper will examine existing literature on differentiation strategies and discuss what kind of impact they have on student achievement.

THE IMPACT OF DIFFERENTIATION

STRATEGIES ON

STUDENT ACHIEVEMENT

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Abstract

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No Child Left Behind educators are often left wondering if individual instruction is the best

instructional practice. The extent to which these strategies impact student learning is also

controversial. Differentiation can be time consuming and tedious on educators. This paper will

examine existing literature on differentiation strategies and discuss what kind of impact they

have on student achievement.

Introduction

Differentiated instruction is defined as those practices employed by teachers who wish to recognize that each student is at a different academic level and that these differences affect how students learn. Educators then make adjustments to their instruction. In the profession, this is known as differentiated instruction (Tomlinson, 2003). It is a strategy teachers can use when they plan content to make it challenging for students who are at a higher level and make accommodations for students who are at a lower level. It is an instructional method in which teachers modify or change assignments to meet the needs of individual students (Heacox, 2002).

Differentiated instruction is not a new topic in the field of education. For years, educators have been trying to meet the needs of their students. Howard Gardner was one of the first to suggest that students have different abilities in the context of multiple intelligences. Some students might be better visual learners while other students might be more apt to learn in a musical setting (Gardner, 2009). Teachers often administer interest inventories at the beginning of they year to find out which style or styles a student has. Finding the student's interest allows the teacher to provide curriculum that is relevant and meaningful.

The process of differentiated instruction starts with the teacher assessing where their students are academically (Schlemmer, 2008). The teacher can then modify assignments to adapt to each individual student. This might mean making the worksheet more challenging or eliminating unnecessary content. It also means that each student is getting the same content with flexibility and making sure it meets curriculum standards (Heacox, 2002). Differentiated instruction is aimed at making sure the students are being challenged and are being taught at their true academic level (Sprenger, 2003).

Making curriculum challenging through differentiation allows students to use higher cognitive thinking skills (Gregory, 2004). It also meets the needs of lower ability students by allowing the teacher to modify the content. Students can learn the basic content at their own pace and then work into the higher level when they are ready (Tileston, 2004). Students who are at a higher level often become bored when basic content is taught and thus create problems in the classroom when they are finished with their work early (Guild, 1998). Differentiating instruction will allow those students to be academically engaged in their work because they are presented material that engages the thinking process.

Student achievement has been an issue raised by No Child Left Behind (NCLB). When schools do not meet certain academic progress expectations, they are put onto a watch list where there is a chance their federal funding could be eliminated if they do not make progress. Student achievement is a concern among parents, teachers, students and at the community level. The National Education Association developed an organization to help close achievement gaps. Achievement gaps are when students of equal ability are not performing the same in school. This group includes race as well as gender. School achievement is a never-ending concern. The Iowa Core Curriculum will also examine student performance in correlation with real world skills and abilities (Robelen, 2008).

Therefore, the purpose of this literature review is to explore and examine the effect of differentiated instruction on student achievement. This literature review seeks to examine the current research-based instructional strategies used to differentiate instruction and to report the impact of these strategies on student achievement.

Research Questions

1. What are the recommended best practices for differentiation?

2. What strategies do educators use to improve student achievement?

3. What evidence in the research literature supports differentiation as a strategy for improving student achievement?

Definitions

For the purposes of this study the following definitions of terms will be applied.

1. Achievement: Effort and quality produced by a student.

2. Differentiated Instruction: According to Heacox (2002), differentiation is when the teacher makes accommodations with instruction and learning for each individual student (p.5).

3. No Child Left Behind: implemented in 2001, a policy that holds teachers accountable through teacher accountability and holding schools responsible for adequate yearly progress.

Significance of Study

This study is important because teachers need to know if differentiation can impact student learning. Differentiation can be expensive to implement and time consuming for teachers. If it does not directly correlate with student achievement and instead proves to be detrimental to academic performance, teachers should look into modifying this strategy. If the use of differentiated instruction is positively related to increased student achievement, teachers should be involved in professional development so that the strategies are implemented in the classroom.

Methodology

This section will identify the databases and search terms used to find information pertaining to this literature review. The first search was conducted using ERIC database and the search terms "differentiation" and "education". The second search was expanded to include all relevant education journals and included the search terms "differentiation and achievement". Due to the numerous articles unrelated to the topic, the search was refined to specific descriptors and included the search terms "differentiation and student achievement". Another search was conducted using the search terms "differentiation and education". The majority of the information came from original research articles found in educational journals. The educational journals and research articles contained additional references and resources that were used. Some information came from textbooks and very little was conducted using websites.

The information collected was found through journal articles. Through the use of journal articles, additional references were sought. The information found was mostly current and articles that did not have any original research or citations were discarded.

The first procedure was to use annotated bibliographies. They were then indexed into categories along with all of the corresponding literature. The first category was Differentiation Strategies. These articles primarily focused on past and current strategies used in differentiation. The second category was Student Achievement. This included information containing the current laws for achievement through No Child Left Behind. The last category was Differentiation and Student Achievement. This category included any research that directly linked differentiation to student achievement.

Literature Review

Current Uses of Differentiation

Students come to the classroom with a variety of experiences and range of

knowledge. For a kindergarten teacher, some students may be able to recite the whole alphabet

because their parents worked with them on it over the summer, while other students may not

have any letter recognition. Differentiation is a strategy that teachers use to maximize the

learning of a student by varying instructional strategies to fit the needs of the classroom

learners(Tomlinson, 2003). Tomlinson (2003) developed steps to use differentiation in the

classroom. These steps take into consideration individual student characteristics. The first step

educators should take is to consider the readiness of the student. Readiness is related to the

previous experiences that the students have had inside or outside of school. Students who

complete activities effortlessly may be making good grades but not learning. Other students may

be performing at a lower rate simply because they are not interested in the topic.

The second step is looking into the interest of the students. Sending home interest

inventories at the beginning of the year allows teachers to group students according to where

their interest lies. For example, if several students mention sports as a topic of interest, then the

teacher could develop a science project where they are examining the amount of kinetic and

potential energy a tennis ball contains. A group that expresses interest in music could develop an

energy rap or song. The main idea is to engage the students in active learning, and grouping

based on interest is one way to achieve this goal (Tomlinson, 2003). Motivation increases

achievement. The third step is learning profiles. The educator examines each students preferred

mode of learning. The learning profile is highly influenced by gender, culture, learning style and

interest. Part of the learning profile uses Howard Gardner's multiple intelligences. In the *Five*

Minds for the Future, students learn though different ways ranging from kinesthetic body movements to intrapersonal relationships (Gardner, 2009). Teachers can use formative assessment, observations and parent input to determine what motivates each student. Students can complete a short survey about their interests. Educators can then use the data to develop a wide arrangement of activities that will appeal to each student.

Instructional strategies. One instructional strategy mentioned is to use literature circles. The teacher facilitates the learning, but they are run by the students. Students choose a book they want to read within their reading level or slightly more challenging. The teacher and students collaborate to develop probing questions to answer while reading the selection. The teacher models effective questioning techniques so the students can see examples of engaging questions. Assessment is also a group effort. The students evaluate themselves based on group participation and the teacher focuses on content and skills knowledge they gained (Tomlinson, 2003). This allows students to take ownership over their work and help hold each student accountable for their share.

Involvement is crucial to the success of differentiated strategies. When students are involved, they are engaged in the learning process and begin to develop ownership over the material. Jigsaw strategies are one way to make sure that all students play a role (Aronson, 1978). Students begin in a home-base group. This is a group where they get information about their task and clarify goals for the individuals and the group. Once complete, they branch out into work groups. This is the group where they will collaborate and collect information they have been assigned. After a set amount of time, they are sent back to the home group to report the information. Making them have to report back to their classmates makes them feel valuable that they have information that the other students did not have or know. It allows the students to teach

each other and work collaboratively. The Iowa Core Curriculum stresses the importance of planning assignments that integrate subject areas and incorporate real world problem solving and working together, so this strategy would be a good example of what could be used in the future to reach this goal (Manzo, 2008).

Tiered lessons. Some educators prefer to use tiered assignments to create their lesson plans. They find it helpful to have a format to follow. Fattig and Taylor (2008) outline six steps to make the process less time-consuming. The first step in creating a tiered assignment is to focus on one big idea, question or concept that educators want students to learn. The second step is to correlate it with grade level standards. This makes sure that the lesson is centered with the grade level benchmarks. The third step is to select a topic around the central idea. If the central idea was to learn about forms of energy, then the topic might be understanding potential energy first. The fourth step is to pre-assess to make sure the teacher is not wasting time teaching something that the students already know. A pre-assessment does not have to be lengthy in order to be relevant. The educator can give a short quiz to see what the students already know. The fifth step is group students according to their previous knowledge and pre-assessment scores. The recommended groups were grade level (for basic understanding), foundational (no background knowledge) and advanced grade level.

The sixth step is to determine what skills the educator wants each group to attain by the end of the activities. This includes questions for students to increase learning. The seventh step is to figure out the resources necessary for each group. For example, if they were researching potential energy students may need access to the computer for information or encyclopedias. The teacher might even want to arrange a classroom visitor or have students email a scientist. The eighth step is plan an assessment for each group that will match with the objectives set. The last

step is to make plans for early finishers or for students who need more challenging work (Fattig and Taylor, 2008). By having an extra activity, it allows students to stay on task and helps minimize classroom disruptions. This format covers all of the groundwork of successful lesson planning from making sure the students are making progress to correlating with standards. It allows teachers to make sure they are designing their lessons with all the necessary steps.

Classroom differentiation. A classroom that is differentiated will have five key elements. One of these elements is a strong link between assessment and instruction (Tomlinson, 2003). The teacher does not make the assumption that the students all have the same knowledge base. They use pre-assessments to develop plans that will work with where the students are starting not necessarily where they should be.

Another element is that the teacher is clear about learning goals. It can be frustrating to students when they are not sure what is expected of them. This means that the teacher is expected to communicate what the students should know, understand and be able to do when they are finished with a particular unit. Communication should not end with the student, the same expectations should be shared with parents. Feedback is an important tool that educators can use to communicate with parents (Brookhart, 2008).

The next element is that the teacher groups students flexibly. This means that the teacher does not limit where a student can grow academically. For example, a student who makes significant progress might be placed in a different group when they are ready. The teacher will also goal set with the students to fit their individual needs. Setting goals allows the student to be a part of the process and gives them something to strive toward. Goal setting provides motivation for students to accomplish a task (Brimjoin, 2008).

Another element is that the teacher uses time, space, and materials flexibly. This means arranging the room to accommodate for all the types of learners that are present. Some students may need a quiet work area to focus, while another set of students might need a workstation with scratch paper readily available. It goes back to making sure that the teacher understands what each student individually needs in order to be successful.

The teacher involving students in understanding the nature of the classroom and making it work for everyone is another factor in a successfully differentiated classroom. Students should be allowed to help contribute to class rules. This takes the pressure off of the teacher and holds the students accountable for their own behavior. When they formulate the rules together, they feel individually responsible to adhere to them. This makes the teacher look like a part of the team instead of the person who is ordering around classroom discipline. This will also help with promoting a positive classroom atmosphere. When there is a positive classroom atmosphere, students and teachers form a mutual respect (James, 2008). Students can help distribute materials and keep records of their goals and progress. By developing a positive classroom climate, the teacher is encouraging everyone to accept each other regardless of their academic ability.

Another element is that the teacher emphasizes individual growth as central to the success of the classroom. This means making sure that parents and students understand that the student is ultimately held accountable for academic growth. Each student should strive for their personal best. If they reach that goal, then the teacher and student can develop a more challenging goal. If the student does not reach their goal, then necessary adjustments can be made to instruction to help the student achieve the goal. Goals can be long term and short term. Student achievement will improve when students have a goal in mind (Jackson, 2009).

The teacher works to ensure that all students produce work that is representative of their abilities. Although differentiated instruction focuses on individual readiness, the teacher should still make sure student work reflects what the student is capable of producing. This involves planning assignments in which the student use higher cognitive thinking abilities and giving feedback to seek their personal best. Sometimes this can be an issue because educators are unsure of how to measure effort.

The teacher should make sure that differentation is always a "way up" and never a "way out". Teachers can sometimes form biases about students' capabilities as learners based on previous test scores or what another teacher may have mentioned to them. It is important that these biases do not impact how the students are grouped. The goal should always be to challenge the student and not let them settle for an easy activity or exhibit learned helplessness in which they become dependent on the teacher for answers. Students can develop a wide range of behavioral problems when they are bored or not actively engaged in the learning process (Guild and Garger, 1991).

The teacher should set their own sights high just like they are asking the students to do. It is not enough to expect that students perform to the best of their capability, teachers need to model this for students in their classroom teaching. Teachers need to realize that not every lesson will go according to plan or that some lessons may not work period. It may not be a reflection on the teacher but a method that was implemented that failed. It is important that educators become reflective and responsive to the classroom climate. The importance is to keep striving for personal growth and success. Another way to accomplish this is to continue to engage in professional development opportunities (Jackson, 2009).

Another factor is that the teacher seeks specialists' active partnership in the classroom. This means including AEA representatives or other community members that may offer assistance or guidance to help and individual student. For example, if there is a student who needs a tutor the teacher could use a Big Brother/Big Sister to come in and help them out. The key to having these programs work is also involving the parents in these conversations. The teacher needs to make sure they are doing everything they can for an individual student. Most of these resources are provided by the school or available in the community.

The teacher's differentiation should be proactive rather than reactive. The educator does not plan one way to teach a lesson but instead a variety of instructional techniques to make sure they are reaching every student. It is important that educators remember that there is not just one correct way to differentiate instruction, it is about using a variety of approaches where each student can experience success.

Reading strategies. For reading, one strategy that can be used is the use of reading bookmarks (Fattig and Taylor, 2008). The teacher and student select a book based on the student's zone of proximal development or independent reading level. It is sometimes helpful if the teacher looks at Accelerated Reading scores or STAR tests to find the correct range. The student is then asked to read aloud as the teacher takes a one-minute fluency read. The teacher then gives the students colorful post-it notes and together they decide where to place these "stop" points for reading. So if a student struggles with comprehension, the teacher may only want to assign a few pages for a day. This helps alleviate the pressure of the student reading a huge chunk of reading in a day when their comprehension would suffer if that was the case. The teacher can also write questions on the "stop" points and have the students write in a journal to make sure that they are understanding the main components of the reading. Reading bookmarks

allow the teacher to make accommodations for each student and work with the student. The post-it notes can be chosen by the students to increase motivation.

Literature on Student Achievement

Pat Guild and Stephen Garger (1991) believe that "individual human differences are positive and should be a resource to school" (p. 36). Student achievement has recently become a huge concern among educators. With the implementation of No Child Left Behind, schools are expected to reach certain standards or they are placed on a watch list and potential funding is cut. In addition several states are now correlating teacher pay with performances on standardized tests. Increasing emphasis has been placed on these scores. Legislation has tightened the grip on what is being learned in the classroom.

Assessment strategies. Robyn Jackson (2009) complains that there is an overemphasis of paper and pencil testing because it is something that has been relied on heavily in the past (Jackson, 2009). These tests are easy to grade and easy to put a score next to. What it fails to mention is how much progress an individual student may have made. For example, a student who was performing at a second grade level in fourth grade may be performing at a fourth grade level when they enter fifth grade. People examine these scores and see that student is behind academically, when the truth of the matter is that they had made significant progress in a short amount of time. These tests only examine one kind of knowledge. Educators should use a variety of assessments to truly measure if the students are meeting expectations. Portfolios are an easy way to show student growth. Students collect work in a binder throughout the year and reflect on their work. Parents enjoy the collection of work and being able to see how much growth a student has made and often keep these portfolios for years.

Feedback is as crucial to testing as using a variety of assessments. All too often educators

assign a score to a paper and offer no comments. This leaves the student feeling frustrated

because they may have thought they did a really good job and not understand why they received

the score that they did. This puts the teacher in the role of being the evaluator and not the

resource or guide (Jackson, 2009). Effective feedback forms a relationship between the teacher

and student. It clears up miscommunication and helps the student understand what they need to

improve. On standardized testing, there is zero feedback given to the student except for a

quantitative score compared to other students. Feedback should not be confused with fixing

errors. It is easy for a teacher to circle a misspelled word or put an indent where a new paragraph

needs to begin. Feedback should be constructive and given in a timely fashion. It should give the

students pointers on how they can improve and also emphasize what they have done well. It

shows that the teacher took the time to read the document and cares about the corrections.

The Iowa Core Curriculum which will soon be implemented will examine how well

students are achieving in other areas besides the general content areas (Manzo, 2008). The focus

is on 21st century thinking skills. These skills are: civic literacy, employability skills, financial

literacy, health literacy and technology literacy. Civic literacy includes everything from

understanding how the government works to becoming a good citizen of the United States.

Employability focuses on how well the person will be able to perform a job and work

collaboratively. Financial literacy includes creating long and short-term goals and looks at saving

and investing for the future. Health literacy focuses on understanding personal, family and

community health issues and concerns. Technology literacy is meant for students to use

technology resources to create original products and interact collaboratively. Now not only are

educators going to be expected to teach the content, but they will be expected to provide opportunities for students to learn real world skills.

Increasing student motivation will increase student achievement (Jackson, 2009). One way educators can do this is to offer choices to the students while still staying within the content that needs to be covered. The teacher can give the topic and then offer a choice on the task to be completed. For example, a book report can be given in a number of formats. Students could use Garage Band to record their voice and relay the information to the class. This method would appeal to the auditory learners. They could also be given the choice to make a comic using a computer program called Comic Life. This method would appeal to the artistic learner. Students could role play a rendition of what happens in the book. This method would appeal to the physical learner. When students are given choices, they are more likely to choose something that interests them.

Another way to do this is to offer problem solving with topics that interest that grade level. For example, having students keeping track of how many commercials occur during one television show and then bringing the data to school to collect and analyze (James, 2005). Students are more likely to relate to something that they encounter in their immediate physical world.

Gerald Edelman (1998), brain researcher, describes the brain like a jungle. Millions of elements overlap and interface with one another in hundreds of complex ways, they rely on each other and no two are the same (Guild and Garger, 1998). Teachers who use one method to teach are not accommodating for all of the ways in which people learn. The same concept goes for the teacher who assumes that every student knows the same information and has the same

background knowledge. Pre-assessments are one method for educators to use to find out what information each student knows and understands before proceeding with a unit.

Students show higher understanding when the tasks they are given are challenging (Zemelman, et al., 2005). For example, a teacher can assign a writing prompt and have all of the students answer. However, giving them a choice on what to write about is giving the student ownership over the activity and making it more challenging and interesting.

Questioning is one technique that can help teachers differentiate instruction. A teacher can give students a short answer test that gauges for basic understanding and issue the same test to another group that will ask for synthesizing and application of the concepts. This can also be accomplished using technology. A teacher can create a test using Garage Band or a podcast and give it to a set of students where the questions check for basic understanding. The next group can be given the test with an expanded version that includes real world applicability. Recording tests can also be a valuable tool if there is a student with a disability who needs tests read to them. This way they can rewind and take the test at their own pacing. This method integrates technology, which is supported by the Iowa Core Curriculum.

Learning styles. Research shows that students have different learning styles. Amy James, Founder of Six Things, suggests that students have three main types of learning: visual, auditory, and physical (p. 19). Visual learners use visual cues to retain information like when the teacher uses flashcards. The auditory learner uses their sense of hearing to process information. The physical learner is a hands-on oriented person who uses manipulatives for understanding. Achievement increases when educators use a combination of these teaching strategies (James, 2008).

Another theorist that examined intelligences was Robert Sternberg. His theory suggests that successful intelligence is the ability to use knowledge with different intelligences (Gregory, 2004). Creative knowledge shows how we use cognitive processes to create questions and problem solve. It is compared to thinking outside of the box. For example, in multiplication drill and practice has commonly been used as a teaching strategy. However, a student who has a problem with memorization may be way behind where they should be. Instead the teacher could introduce strategies or approaches that will appeal to the whole class. One example is using pictures to solve multiplication problems or using a number line to place the problem in the correct spot. For the student who enjoys art, they may enjoy using a picture to find the answer. There is not one correct way to find the answer to a problem. Students need to be encouraged to not get frustrated and try new ideas.

The second intelligence he examines is analytic intelligence. This is the type of thinking that solves the problems and makes choices. It involves judging items critically. In comparison to Bloom's taxonomy this would be similar to the analysis level. The student begins by identifying the problem and creating their own solutions. So in the example mentioned above, the teacher might ask students to develop their own new strategy or see if they can find any patterns to share with others. It also involves the students in collecting and analyzing data.

The third intelligence is practical intelligence. This is taking new information and using it a whole new way. It is considered to be action-oriented and encourages students to take what they have learned and make a difference with it. In the multiplication example, this would be when the student teaches another student or the whole class a method they have developed. In his theory, Sternberg suggests that each student may have a stronger intelligence area than another and can work collaboratively to make sure that all students are actively engaged and learning.

Differentiation and Student Achievement

Differentiation aligns with state and district standards. It also incorporates key components of the Iowa Core Curriculum. The Iowa Core Curriculum will be utilized in the near future and the goal is to prepare students for 21st century thinking skills (Manzo, 2008). Differentiation makes sure that each student is getting the skills necessary to be successful.

One challenge is that educators who support differentiation would not be in total agreement with ITBS (Iowa Tests of Basic Skills) because it is a standardized test that expects learners to possess the same content knowledge and achieve certain scores. It does not look into the individual differences that differentiation recognizes. People from different cultures may interpret questions differently or might be raised to answer the question in a different way. Some students may have test anxiety, may not understand the question, and may perform better on a performance-based test. When rooms are too hot, studies show that student behavior becomes more aggressive because the heat causes a change in the balance of neurotransmitters (Sprenger, 2003). Differentiation strategists would be more supportive of a portfolio based assessment which measures student growth or a series of tests which take all learning styles into account.

Project-based learning involves students, motivates them and enhances learning. Using well-designed projects asks students to "show" what they have learned. It incorporates reading, writing, research, planning, problem solving, self-discipline, self-evaluation and presentation (Schlemmer, 2008). Schlemmer observed that when students work carefully on developed and curriculum aligned projects they:

1. Participate at an appropriate readiness level.

2. Make personal choices that result in individualized learning experiences.

3. Take ownership over their own learning.

4. Tackle authentic tasks that represent things done in the real world.

5. Apply skills and knowledge within a content that makes the learning meaningful.

6. Build confidence in themselves as self-directed learners.

7. Develop unique final projects.

8. Demonstrate in personal ways what they are capable of doing.

9. Work independently, with a partner, or in groups.

10. Focus on topics of interest.

Thomas Armstrong (1996), a special education teacher, completed research on the diagnosis of ADD (attention deficit disorder) and medications prescribed to students. He found that the common symptoms of ADD including hyperactivity and distractibility were in fact symptoms caused by the students being bored and restless with the curriculum. Students were medicated, when a solution to the problem could have been making the curriculum differentiated or more challenging (Guild and Garger, 1998). All too often medication is seen as the first answer instead of considering that the underlying cause may be a mismatch between the classroom curriculum and student learning style.

Activities need to be authentic and challenging to ensure student success. The ICC is going to place increasing pressure on educators to provide engaging lesson plans that will incorporate real world skills. Educators will need to examine previous knowledge by giving a pre-assessment or pre-test to see where each student is at individually. It is important to remember that students construct knowledge in different ways and at different rates. In the past, it has been viewed that every student should have the same knowledge when they enter the classroom. Demographic and societal shifts have resulted in increased student diversity and changed the composition of our classrooms. Students are coming to us with a variety of cultural,

academic and social needs that were not addressed in the past. By identifying where each student is, the teacher can make learning a constructive experience where each student will feel successful. When activities are authentic and challenging it will create powerful cognitive learning experiences (Zemelman et. al., 2005).

Art Costa (2008) describes several intelligent behaviors that will help teachers be successful with differentiating instruction and improving academic success. They are:

1. Persistence and not giving up when facing challenges.

2. Decreasing impulsivity and control frustration when it doesn't immediately work.

3. Empathic listening and put yourself in the students shoes.

4. Metacognition and be aware of your own thinking.

5. Flexibility in thinking and try out new ideas.

6. Checking for accuracy and precision and know what quality work looks like.

7. Posing of questions and problems and continue to acquire new information.

8. Drawing on past experience to new situations and reflect on past experiences.

9. Using precise and accurate language and descriptive language.

10. Using all senses and allowing students to use all senses in activities.

11. Creativity and explore solutions to problems.

12. Sense of efficacy as a thinker and move from timidity to confidence.

Students perform better when they take ownership over their work and enjoy the task at hand. Learning contracts are one way to incorporate differentiation in the classroom and help students achieve success. Learning contracts are set up by the teacher and revolve around the readiness of the student. For example, there might be a small group who uses red folders to get activities. The red folders will be pre-prepared by the teacher and will include activities that

reinforce basic concepts taught. Another group may be on blue folders that contain higher-level thought processes. The students who need to be challenged might be placed in a purple folder group where their activities are to analyze or apply their knowledge in a different way. Teachers have found that use of learning contracts allows each student to be successful and perform better academically (Tomlinson, 2003).

A challenge for educators is finding the time to differentiate curriculum. It can also be frustrating to develop assessments for the variety of instructional strategies being used. It also can be hard to measure what a student is truly capable of producing. Linda Fattig (2008) offers step-by-step guidance to help making plan differentiated instruction easier (Fattig and Taylor, 2008). The first step is to have educators determine the topic of study that they want to focus on. The second step is to determine the method of pre-assessment. This may be a formative checklist observation or using questioning techniques. The most important thing to remember is to consider the skills and prior knowledge that the students need in order to show proficiency. The next recommended step is to create three groups of students (foundational, grade level, advanced grade level) and place the student where they best fit.

Rubrics can be a valuable resource. The teacher can formulate common themes that each group need to include. For example, a book report rubric can have common categories such as: character description, main events, setting, plot, comparing and contrasting to another piece of literature. From those common guidelines, the projects can be based around interest and ability. Another method is to provide specific and timely feedback to individual students. The personal connection of meeting with individual students increases mutual respect, increases achievement and motivation (Gregory, 2004).

In writing instruction, peer conferencing is one method to encourage group collaboration. First students brainstorm and pre-write a rough draft. Then they read their paper out loud to a friend. This gives the author a chance to catch anything they did not think flowed or sounded the way they wanted. Each student meets with the teacher and the teacher gives suggestions. At the end of the conference the student can ask questions and get clarification.

A well thought out differentiated unit will ensure academic success (Tomlinson, 2003). The teacher first needs to use pre-assessment to figure out where the students are. Then the teacher uses a big idea that they want the class to learn and correlates it with state, district or national standards. The teacher examines what they want the students to gain from the activities by using measurable objectives. Then the educator can make a list of what instructional strategies they want to use. For example, the first column would include the pre-assessment and introduction portion. The second column would map out the lesson and objectives. If the teacher was teaching a unit on plants, they would include what they want the student to learn and approximately how long the lesson would take. In this section, the teacher will include what instructional strategies arc best for their grouping of students. This may involve using the jigsaw method or learning stations.

Research also shows students use different memory skills to learn. The first is sensory memory which is when the brain gains information by using our senses. The second is our short-term or working memory whcre information is being processed but discarded if the brain sees no reason to retain the information. There is also the long-term memory where facts are stored and the step by step processes we know to do a skill is stored.

Gregory (2004) gives us ways to capitalize on the ability of the sensory memory and use it in conjunction with differentiated strategies. The first way is to offer a challenge. This allows

the student to make connections with previous knowledge to answer the challenging question or come up with new ideas (Gregory, 2004). Teachers can also give the students a problem to solve in groups. This will allow the teacher to use formative assessment to see how much students already know about a topic.

Another way is offer a dilemma. The students are given an intriguing question to answer where they will have to think for themselves. Then they should be allowed to turn and share their answer with a partner. Stories are another effective strategy. The teacher will engage the students in a story related to a topic to get them motivated to learn more about it. The teacher should ask probing questions and ask students to predict something that might happen in a particular passage. Using puzzles can be effective because they engage students and give them a new challenge to try to answer. Firsthand objects are a great way to involve the senses. For example, if teaching a unit on Titanic, the teacher can show a virtual online tour of the wreckage or bring in artifacts borrowed. Teachers can use novelty items to engage interest like coming to school in a Civil War outfit when studying a unit on the Civil War.

It is crucial to have administrative support to promote the use of differentiated instruction. McKinleyville Middle School implemented a school-wide support system that utilized differentiated instruction and experienced an increase in school academic achievement (Fattig, 2008). The success was attributed to many factors. The change was prompted because of frustration among teachers to better meet the needs of their students. The staff then decided to develop an action plan. The change was initiated by the teachers which was important to the successful outcome. If it would have been initiated by the administrator, it might have been looked at as "one more thing" to do. The next success factor is that the model continued to evolve even after the action plan was developed. It was not implemented and forgotten about.

Teachers continued to meet and discuss ways to improve the situation according to all students' needs. The staff went through the same training program according to Richard Curwin's (2008) "Discipline with Dignity" model and the best part of the program was that was provided at no additional cost to the staff. This was possible with the reallocation of existing faculty members to focus on staff development. Teachers were not expected to understand and use the model overnight, it was something that was spaced out in a yearly timeframe. The collaborative and efficient use of the program allowed it experience success.

<p style="text-align:center">Conclusions and Recommendations</p>

Differentiation has a positive impact on student learning when implemented in an appropriate fashion. Administrators need to make sure teachers have enough time and professional development opportunities to develop meaningful and relevant lesson plans, as that has been a complaint in the past. Educators need to continually be aware of the changing expectations of curriculum including the changes brought on by No Child Left Behind and the Iowa Core Curriculum. The Iowa Core Curriculum will ask educators to differentiate instruction by providing real world experiences for each student (Manzo, 2008). A successful educator will stay up to date with the district and national standards (James, 2005).

Differentiation strategies will allow each student to experience success and improve the overall learning. Sometimes educators are not even aware of community resources which are available to them to make sure a student succeeds. For example, contacting the local Big Brother/Big Sister program to work with individual students would provide additional resources for struggling students. Using innovative cooperative learning approaches like jigsaw strategies and individualization strategies like reading bookmarks are easy ways to make differentiation a part of classroom curriculum (Aronson, 1978).

Multiple intelligences and assessment play a crucial role to the success of differentiated instruction (Gardner, 2007). The successful educator will know what each student is interested in and offer choices in the classroom to promote success. This type of teacher will come out of their comfort zone and try new methods and strategies to make sure that each student is being reached. It will be a hard adjustment for educators who have taught one specific way for a period of years and ongoing professional development is necessary for successful implementation.

Giving educators tools to help make planning easier is one method than can alleviate the stress that can come from developing differentiated instruction. Offering a variety of assessments and rubrics will help set clear expectations (Jackson, 2009).

The next step is to determine target skills at each level using Bloom's taxonomy as a guide. This will also help to make sure that all levels of knowledge are being applied in the unit. The teacher should develop critical questions to incorporate the target skills. The point is not to ask questions that can be simply answered but instead develop questions that will challenge the students to think. The teacher should next decide if they want to use a tiered, menu, or linear contract for teaching and learning. This will provide ownership for the teacher and each individual student. The final step is to reflect and respond. The students can take an active part in that process by reflecting on whether or not they reached their own personal goals. The teacher can look at whether or not the lesson was successful and what they could have done to improve it. They also can look at what really worked and share it with others.

It never fails that teachers with a positive can-do attitude will encourage success. Teachers get frustrated when new strategies are implemented without consultation. Therefore, they can develop negative attitudes toward change. It is recommended that schools form communities of learners in which willing colleagues lead the group and talk with fellow staff

members about what kind of changes they are looking for. It is better for everyone when it change efforts take place gradually with adequate time for open discussion.

The best advice is that educators take the time to know their group of students and understand that not every student learns the same way. Educators should keep the lines of communication open with parents and students so that everyone is on the same page (Jackson, 2009). By using effective feedback, students will be able to increase academic achievement (Brookhart, 2008). While differentiation can at first seem to be time consuming, it actually saves time and frustration because it can lead to improved student achievement. It is important that the teacher goes into the strategy with an open-mind and realize that not everything will work perfectly the first time it is implemented. It is a practice that can only contribute to and enhance the performance and capabilities of each student.

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