

## **Differentiation in Practice: An Exploration of First Year Teacher Implementation of Differentiation Strategies as Expected Outcomes of Teacher Preparation Program**

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*Differentiated instruction, or designing instruction to meet the needs of a variety of learners, has received much attention in continuing and higher education for several years and the middle school philosophy has centered upon differentiation as fundamental to effective teaching. Vast amounts of human and capital resources have been committed to improving the skills of classroom teachers to differentiate instruction. However, very little research has been completed that investigates how well those trained to differentiate instruction actually implement it in their practice. The purpose of this study is to investigate how superior graduates of a teacher education program that focused on differentiation implemented differentiation in their first year of teaching. The results of the study provide insight into some of the difficulties of moving beyond training to implementation.*

The middle school philosophy, as outlined in *This We Believe* (National Middle School Association, 2003), emphasizes the importance of instructional strategies to meet the needs of diverse learners. In recent years, individual strategies have been referred to in our professional vocabulary as the umbrella term “differentiated instruction”. Tomlinson (2001b) further refined our understanding of teaching strategies to meet the needs of diverse learners through categorization of differentiation strategies as it relates to students.

Differentiated instruction has received much attention. The importance of differentiation is evident in the program schedules of educational conferences, published journal articles, and the syllabi of teacher preparation courses. Much has been published about the importance of differentiation and how to differentiate. Thus, those who prepare teacher educators have revised courses to focus on differentiated instruction as a key component of pedagogy.

Much has been written about the importance of differentiation (Brandt, 1998; Gurian, 2001; Levine, 2002; Tomlinson, 2003; Tomlinson & Allen, 2000; Tomlinson & Kalbfleisch, 1998; ), differentiation in middle schools (Tomlinson, 1998; Tomlinson, 1995), differentiation strategies (Burke, 2002; Cole, 1995; Gartin, Murdick, Imbeau & Perner, 2002; Houk, 2005; Kajder, 2006; King-Shaver and Hunt, 2003; McTighe & O’Conner, 2005; Owocki, 2005), and differentiation and assessment (Brimijoin, Marquisee & Tomlinson, 2003; Krumboltz & Yeh, 1996; Moon, 2005; O’Connor, 2002; Sternberg, 2006; Tomlinson, 2007; Tomlinson, 2001a).

However, a review of the literature indicates that we have neglected to investigate how this training in differentiated instruction transfers to actual implementation in the classrooms of new teachers. Other research provides some insight. Bangel, Enersen, Capobianco & Moon (2006) investigated how a pre-service course and practicum designed to prepare students to meet the needs of gifted students impacted the students’ understanding of how to meet their needs. Through triangulated measures, they found that students believed they understood the needs of gifted students after completing the coursework and practicum. However, this study did not include a follow-up examination of actual implementation of the knowledge and skills these pre-service teachers felt they had gained, as new classroom teachers. Miller (2009) investigated how elementary teachers who had been trained (staff development) in gifted education and gifted identification applied their training when identifying gifted children. Comparisons of teachers with greater and fewer hours of training in gifted education showed no significant differences between the groups, suggesting that conceptual and skill training does not always lead to implementation of the desired concept or skill. Mertens, Flowers, & Mulhall (2002) investigated the practices of middle school teachers and found that those with a middle grades teacher preparation background and certification engaged more frequently in “best practices” than teachers with other training and certificates, for example secondary. This research is promising. However, it did not focus on differentiation, although differentiation was considered as part of best practices,

or new teachers. With little research to guide us, professionals question whether differentiation is actually being implemented in the classroom or if it merely a “buzz word”, despite the human and financial resources dedicated to it through teacher education and staff development.

### **Purpose of the Study**

The purpose of this study was to investigate, through observation, how first-year classroom teachers who were prepared to design differentiated instruction in their teacher education programs implement differentiated instructional strategies.

### **Research Questions**

1. How do first year teachers who have been trained to design differentiated instruction implement differentiation in their classrooms, according to Tomlinson’s model (2001) of differentiation of content, process, and product related to student readiness, learning profile, and interest?
2. How do first year teachers evaluate themselves in terms of implementing differentiated instruction?
3. What are the barriers, if any, that first year teachers perceive in implementing differentiated instruction in their classrooms?
4. Is there a difference in the level or types of differentiation in classes with greater student diversity?

### **Significance of the Study**

Differentiated Instruction, as an umbrella term that refers to instructional strategies designed to meet the needs of diverse learners, has been accepted as an important pedagogical skill. Colleges of education and school districts have committed many resources to foster implementation of differentiation in the classroom. School systems value recent graduates who can discuss differentiation and strategies they will use in the classroom. It is important to understand how new teachers, trained in differentiation, actually implement differentiated instruction and the barriers they believe prevents implementation. From these understandings, teacher education programs and school districts might improve actual implementation.

### **Limitations of the Study**

The teachers included in this study represent the knowledge, skills, and dispositions our college deem as outstanding, but they may not represent other teacher preparation programs as well. This study is an exploratory pilot study with purposeful sampling of two new teachers

who were trained in differentiation and demonstrated mastery of differentiation within the teacher preparation program. In addition, their status as first year teachers likely does not reflect how well they will implement differentiation after the initial first year. While the researcher attempted to visit their classes at various times of day, some classes were visited more than others and may not reflect the totality of their differentiation during the day. Initial observations were scheduled, but one of the participants suggested we were looking for evidence of differentiation and there was some concern this teacher was purposely including these strategies during scheduled visits. To avoid bias, the participants were asked to allow unscheduled visits and they agreed. While generalizations based on this pilot study should be avoided, their experiences will provide information for additional research and insight into the barriers to implementing differentiated instruction.

### **Definition of Terms**

1. Differentiated Instruction: Teachers proactively plan varied approaches to what students need to learn, how they will learn it, and/or how they will show what they have learned in order to increase the likelihood that each student will learn as much as he or she can, as efficiently as possible (Tomlinson, 2003)
2. Differentiation Model: A model for differentiating instruction as conceived by Tomlinson (2001b). The model focuses on differentiation of content, process, and product as related to student readiness, learner profile, and interest.
3. Collaborative Class Period/Class/Classroom: A class period designated as remedial instruction due to special education, ESL, behavioral difficulty, or failure on standardized test status of students. A teacher’s aid is often, but not always, present in the room to assist the students in their work. The level of collaboration between teacher and aid varies greatly and is often minimal in instructional planning.
4. Differentiation of Content: The use of a variety of materials for diverse learners; also includes a variety of means of accessing content. Examples include utilizing reading materials at varied levels and utilizing the Internet to access information.
5. Differentiation of Process: The use of a variety of processes, or what students do with content, to meet the needs of diverse learners. Examples include mini-lessons, tiered lessons, and student contracts.

6. **Differentiation of Product:** The use of a variety of products to assess what students have learned. Examples include products based on the multiple intelligences, the products of student/teacher developed contracts, and performances.
7. **Student Readiness:** The knowledge, skills, and understandings students possess or do not possess in relation to the curriculum to be addressed. Examples include students reading above grade level, students who have not mastered a skill needed at grade level.
8. **Student Profile:** An umbrella term for student preferences in terms of multiple intelligences, learning style, and cognitive style. Examples include students with a musical intelligence, students who prefer to work alone, and analytical thinkers.
9. **Student Interest:** The interests of students regardless of apparent relationship to curriculum. Examples include an interest in clothing, sports, or current events.

### **Background**

Undergraduates in the teacher education program complete coursework during their junior and senior year designed to develop both pedagogy and content knowledge. Each semester they also participate in field experience in an area school culminating with a full-time Internship their final semester. During this time, they are required to successfully complete several pedagogy courses specifically designed to develop their understanding of the middle grade learner and their ability to design appropriate instruction. One of these courses focus on instructional design with a heavy emphasis on differentiation of instruction. Students in this course are expected to demonstrate mastery of differentiated instruction through coursework and to demonstrate these skills in their field placement assignment and final Internship. Tomlinson's model (2001b) of differentiation is utilized as a framework for how to differentiate instruction.

The model includes the following:

1. Differentiation of content (also including how students access content)
2. Differentiation of process (what students do with information)
3. Differentiation of product (the evidence of learning)

As each relates to:

1. Student readiness (reading and language skills, skill mastery, learning disabilities, gifted)
2. Student interest
3. Student learning profile (learning styles, cognitive style, multiple intelligences)

In a follow-up course, students apply their ability to differentiate instruction more intensely through a strategies course in their chosen content areas (math/science or language arts/social studies).

### **Sample**

A combination of purposive and convenience sampling was used. Two first year teachers in the 2008-2009 school year were invited to participate in the study because they had demonstrated mastery of their undergraduate pedagogy course work (A's in their course work and successful field placements/Internship) and because they had demonstrated positive dispositions through conference presentations and/or leadership in our chapter of the Collegiate Middle Level Association. Courses focusing on differentiation were in their 4<sup>th</sup> year in the 2007-2008 school year, thus providing time for instructors develop instruction, assessments, and link to field experiences well. It was expected that first year teachers in the 2008-2009 school year were consequently prepared better to differentiate in their classroom than previous graduates. It was also assumed that first-year teachers who demonstrated mastery of differentiation in their coursework were most likely to implement differentiation in their own classrooms. Convenience sampling was also utilized to select first year teachers close to the university and in the same school. Neither teacher was enrolled in graduate studies at the university, an additional measure to prevent researcher/participant bias.

### **Angela-Math**

Angela demonstrated the knowledge, skills, and dispositions of a professional educator we desired as a faculty. She could also be described as vivacious, curious, and genuinely committed to teaching well. Angela was a founding member of the university's chapter of the Collegiate Middle Level Association organization and her classmates looked to her for leadership in their courses and through the organization. Many who observed her teaching in her field experiences called

her a “natural teacher”. She continued to participate in the state middle school organization and presented at the annual conference during her first year teaching.

### **Sarah-Social Studies**

Sarah also demonstrated the knowledge, skills, and dispositions of a professional educator we desired as a faculty. She, too, was passionate about teaching well and could be described as very reflective. She often questioned her work, the nature of middle level learners, and her ability to meet their needs. Her reflections weren’t necessarily self-doubt, but instead an understanding of the complexity of the teaching-learning process. Sarah was sought out by others in her course work who wanted someone to talk with about teaching and she made friends easily with her “easy-going” attitude. Sarah demonstrated a commitment to the profession by presenting at the state middle school association conference her senior year and also during her first year teaching. She continued to participate in the state middle school organization and presented at the annual conference during her first year teaching.

Angela and Sarah were both in their early 20’s when they began their teaching career. Both were well-liked by their administrators and their assigned principal informed the researcher that she was very pleased with how well they were teaching. Both struggled with typical first year issues related to classroom management and discipline; however Sarah appeared outwardly to feel more distress than Angela. Both Sarah and Angela were very “open” in their discussions with the researcher and welcomed the researcher’s presence in the classroom. A positive relationship with the teachers had been established long ago, as students in the researchers’ courses. Sarah and Angela teach in the same grade level at the same school. The school is a National Blue Ribbon of Excellence school and is committed to differentiation, as evidenced by posters on administrators’ doors reminding teachers of the various types of differentiation teachers are expected to implement. Both teachers were struggling to master the complexity of meeting the needs of diverse learners, classroom management, and time management – issues quite common for new teachers.

### **Procedures and Data Collection Instrument**

After identifying Angela and Sarah as potential subjects, the researcher sent an email requesting they allow me to visit their classrooms for the purpose of research. The exact purpose of the research was not revealed other

than a desire to observe their pedagogy. A schedule for visits was arranged and some visits were “drop-in” as well. An initial interview was conducted with each teacher to understand the nature of their classroom and their students. Once observations were complete, a post-observation semi-structured interview was conducted. The participants were assured anonymity and both teachers agreed to participate and participated fully.

A quantitative observation instrument was developed to record evidence of differentiation in Angela’s and Sarah’s teaching (See Appendix A). The instrument reflected the differentiation model they were taught in their teacher preparation program. Definitions for differentiation of content, process, product as it relates to student readiness, learning profile, and interest were based on the Tomlinson model (Tomlinson, 2001 a). For each instance of differentiation observed, a “tally mark” was placed in the category that best reflected the differentiation. Differentiation, according to this model, might include overlap of differentiation of content, process, and product. Thus, they were recorded separately with notes to explain. During observations, we only differentiation strategies observed during the observation were recorded. However, notes were made related to other evidence of differentiation not observed. Examples of this included student work displayed in the classroom that was not witnessed, classroom assignments or information posted in the classroom for class periods other than what observed, or unsolicited comments from teachers about what their classes had been doing or were doing that day. These unobserved examples of differentiation were not included on the tool in the usual manner, but rather notated at the bottom of the observation instrument.

Thirty-five observations (1 class period = 1 observation) were conducted in Angela’s classroom and 32 observations were conducted in Sarah’s classroom (1 class period = 1 observation). Observations were conducted in various class periods; however an attempt was made to observe collaborative classrooms more frequently than others because these classes would seem to benefit most from differentiation.

### **Findings**

Both teachers differentiated instruction to some extent, but both struggled to implement the differentiation strategies that would have assisted them most in their difficult collaborative classrooms. See Appendix B.

## Angela-Math

**Differentiation of content.** Angela relied primarily on the textbook and worksheets. However, Angela had a bit of an advantage, in terms of differentiating content (especially how students access content) because she inherited a classroom with a “Smart Board”, while Sarah’s room did not have this technology available. Angela routinely used the “Smart Board” as a tool for how students access information. She also utilized videos and music clips provided by the publisher of her required textbook, utilizing the “smart board” to share this content. As an example, students viewed a textbook published “rap song” that addressed fractions. Angela utilized textbook publisher worksheets to differentiate content for her classes, based on the general skill level of each class, but not the skill level of individual students. She addressed the same math standard in classes during the day, but would utilize different worksheets according to skill level. Other forms of content differentiation such as literature and Internet websites were not observed.

**Differentiation of process.** Angela differentiated process according to learning profile by providing opportunities every day during the “warm-up” for her students to “get up and move”. Adolescents need opportunities to move about and she asked students each day to move to the whiteboard and solve problems she posed utilizing the “white board”. While Angela differentiated the content based on readiness (different worksheets for collaborative classes based on same standard), there was little evidence of other forms of differentiating process. The worksheets were not representative of tiered lessons. Other forms of differentiation of process such as mini-lessons, learning/interest centers, writing about math (example – RAFT, GRASPS), anchor activities, or use of Webquests/Internet were not observed. She did not differentiate the process for individuals within her classes or the processes of learning from one class to another. The process for students in her low to high performing classes were essentially the same, but with varying levels of worksheets/problems to solve. (Researcher note – delineating the different forms of differentiation can be difficult as the categories sometimes blur. I chose to view differentiation of process as a differentiation of what students *do* with information, rather than the fact that the problems were different levels.)

Angela’s students had access to 5 student computers with an Internet connection. The researcher did not observe students utilizing the computers during any of

the visits. Online math games, Webquests, the development of Power Point presentations or documents are all examples of differentiation of process that could have been utilized.

It was interesting to note that in Angela’s Collaborative classes, the teacher-aid assisted students with their work by sitting next to them. However, there appeared to be very little collaboration in terms of planning the lesson to include, for example, time for the teacher to conduct mini-lessons with small groups or a combination of learning-centers and small group instruction.

**Differentiation of product.** The researcher did not observe differentiation of product in Angela’s math classes. This could be an affirmation of the researchers’ experiences and beliefs that math teachers, more than other subject area teachers, often resist differentiation of product and rely instead on the textbook or worksheets with mathematical problems to be solved. During an observation, I did note student drawings on the wall as a product to demonstrate understanding of symmetry. Differentiation of product was evidenced by the drawings, but likely not a frequent form of differentiation as the researcher did not observe it during any of the observations.

**Additional observations.** Angela struggles with a class identified as “collaborative”. This is likely the class that needs differentiation of instruction the most! A special education/ESL para-professional teacher aid was assigned to assist Angela during this class. Ideally, the teacher and para-professional would work together to develop instruction and function as a team in the classroom. Interviews and observations indicate that there is little collaboration between the “Aid” and classroom teacher. The “Aid” is inconsistently present and appears to be primarily in the room to deal with discipline problems and assist individual students. (Discipline issues appear to be most important). It was not clear through observations alone if Angela desires more time to collaborate with the “Aid” to design instruction, if she is content with the Aid mainly sitting with students and offering assistance/managing behavior, or if the aid wishes to collaborate more. Angela’s schedule makes meaningful collaboration impossible. Both teacher and “Aid” appear in demeanor to be a bit overwhelmed by the collaborative class.

## Sarah-Social Studies

**Differentiation of content.** Sarah relied primarily on the textbook for student content. However, she also utilized videos and power point presentations to present

content to students. Other forms of differentiation of content such as the use of literature, the Internet or Internet material, were not observed. Of particular concern, one of her collaborative classes included several ESOL students. The researcher observed that these students' textbooks were identical to other students' textbooks, instead of being highlighted to assist in accessing the content, an important form of differentiation of content for ESOL students. In addition, graphic organizers to aid students in accessing the content (textbook, video, or power point) were used infrequently. Other forms of art or music content that would be appropriate for a social studies classroom were not observed, but again Sarah did not have the advanced technology in her classroom that Angela did.

**Differentiation of process.** Sarah's students frequently were asked to read the text and answer textbook questions. However, she also utilized small groups, if not necessarily cooperative learning groups in design, for students to complete some tasks such as creating maps, posters, and other creative tasks. Sarah's differentiation of process most often related to learner profile and those students who were verbal or visual and very seldom included processes that would appeal to the kinesthetic learner. She included a fairly good combination of independent and small group work. Other forms of differentiation of process including tiered lessons, mini-lessons, learning/interest centers, writing such as RAFT/GRASPS, or technology based activities were not observed.

**Differentiation of product.** Closely related to differentiation of process, Sarah provided students several opportunities to demonstrate what they learned through products such as maps, posters, and drawings. The products were both independent and group produced. The products Sarah assigned were generally interesting, but did not include student choice based on their interests. The use of contracts would enhance her teaching, as it is evident she wants students to develop quality products. While the school has computer labs available, the researcher did not observe any lessons that required students to develop technology-based products. In addition, the use of student performances would be an interesting form of differentiation to add to her classroom.

### **Barriers to Implementation of Differentiated Instruction**

These teachers offer insight into new teachers' perceptions of the barriers they face in implementing

differentiated instruction. These insights were obtained from the first interview prior to observations, through informal discussion, and through the final interview. Note that only during the final interview was the purpose of this study, differentiation, mentioned by the researcher. You will see that these comments relate well to differentiation, even when it was not the specific topic as in the earlier interview and informal discussions.

1. **Lack of Time:** Both teachers indicated that they were struggling to keep up with the many new demands on their time. Both indicated that they wanted to improve their instructional design and were looking forward to breaks and summer as a time to design improved lessons.
2. **Behavior Management:** Both teachers indicated that their collaborative classrooms were the most challenging because of student behavioral problems. They also indicated that managing poor behavior consumed their attention and drained them mentally. Neither teacher expressed a real understanding of the connection between differentiation and improved behavior.
3. **Collaboration Problems:** Both teachers appreciated having an aid in their collaborative classroom, but primarily as an extra disciplinarian. Both expressed a desire to collaborate with the aid to implement differentiated strategies and improve instruction. The primary obstacle, according to these teachers, was that no daily or even weekly time was provided for them to meet with the aid and plan instruction. Also, they disliked not having the aid in their classroom on a regular schedule. They did not know when to expect the aid in their collaborative classroom. Somewhat reluctantly, these new teachers admitted feeling uncomfortable with the aid and the relationship. At times, they felt intimidated by the aids who had more years of experience in the classroom and at other times they wanted to take the lead and were frustrated with the aids' lack of content knowledge and pedagogical skills. On the whole, they felt the word "collaboration" meant very little because they weren't able to collaborate for the reasons above.
4. **Sense of Powerlessness:** While both of these teachers felt somewhat confident in their abilities, they also expressed some trepidation in asking for help from faculty members who could assist them in differentiating instruction, special education and ESOL teachers for example. One of the teachers recalled a teacher education course discussion about

the services these faculty members could provide. The other teacher recalled discussion about their services during the fall faculty staff development. During our conversation, the researcher encouraged them to seek assistance without fear. They both indicated they would, but their body language suggested otherwise. It is not clear if this fear of seeking help was due to school culture, difficult or unhelpful teachers, or simply a fear of asking for help and being seen as a weak teacher. Overall, these new teachers seemed powerless to request the assistance they deserved. (Note – both teachers indicated great satisfaction with the assistance their team members provided and were not fearful of asking for their help.)

5. **Organizational Skills:** Both teachers indicated that when it was time to prepare lessons, they were somewhat satisfied with the resources available to them through their district and from their teacher preparation courses. However, both indicated that they never seemed to have what they needed when they needed it. Similar to the time management issue discussed above, both looked forward to breaks and summer to organize their materials to improve their ability to differentiate instruction.
6. **Curriculum “Coverage” and “The Test”:** Both of these teachers were afraid that they would fall behind in “covering” the curriculum before “the test” in March. They were afraid that if they differentiated too often, for example differentiation of product, they wouldn’t be able to “cover” the curriculum before the test. Both expressed a desire to differentiate, but a stronger need to master the curriculum itself first. Both expressed a desire to work with others during work hours to “map” the curriculum and develop differentiated instructional strategies.
7. **Limited Classroom Space:** Both teachers expressed a concern that their classrooms were too small to do some of the activities they desired. Their classrooms were in a modern building and were of average size; however, they both had some class periods with many students due to growth in the district.

## **Discussion**

### **Differentiation of Content**

Both of these first year teachers applied some of what they had learned about differentiation of content in their teacher preparation program and in various ways. Both were primarily textbook bound, in terms of content, despite two required reading courses and a rigorous middle

school literature course in which they read more than 60 middle level books related to their content areas. Both were more likely to use technology to differentiate content than literature. Fear of falling behind in “covering” the curriculum may be the most likely cause of this, as both mentioned this as a barrier to differentiation in general terms. Both teachers described their collaborative classes as the most difficult to teach and manage, especially ESOL students and students with reading difficulties. There was little evidence of implementation of differentiation strategies that would specifically address these learners such as the use of graphic organizers or highlighted text, even though several of their teacher education courses focused on these strategies and others to differentiate content for struggling readers. Both expressed a desire for more time to collaborate with the collaborative classroom aid and also reluctance to ask special education or ESOL teachers for help. A proactive approach to assisting teachers in differentiating content, rather than waiting for them to ask for assistance, and time provided during the work week for collaboration with collaborative classroom aid would likely improve differentiation of content. For example, major points in textbook readings could be highlighted and graphic organizers could be developed.

### **Differentiation of Process**

Differentiation of process strategies such as small group instruction, mini-lessons, learning/interest centers, and tiered lessons were not observed. Additionally, neither teacher used technology and the computers available in their classroom to differentiate process. There was a notable difference in differentiation of process. Sarah (Social Studies) implemented small group work somewhat frequently; however, Angela (Math) did not do so. These teachers described lack of classroom space as a reason for not utilizing learning/interest centers. Teacher education professors might want to consider focusing on this “real world” issue and include learning/interest centers as compact folders requiring no additional space in the classroom. Tiered lessons, as a form of differentiation of process, were not observed. However, first year teachers simply may not have a base of understanding of the curriculum and their students to tier lessons during their first year.

### **Differentiation of Product**

Both teachers implemented some differentiation of product. However, the researcher observed differentiation of product much more frequently in Sarah’s social studies

classroom compared to Angela's math classroom. During their teacher preparation courses, both teachers had been trained to differentiate product in their content areas. These observations are consistent with what I have experienced or observed as a middle school teacher and a university field experience supervisor. Math teachers infrequently utilize products for assessment. Sarah included products as part of her assessment; however, she did not utilize student choice of products or contracts. Differentiation of product in Sarah's classroom was teacher centered and focused mainly on visual or verbal products.

### **General Comments Related to Implementation**

Having passed some judgment on the implementation of differentiation from my former students, consider that the leading advocate of differentiated instruction, Carol Ann Tomlinson, advised new teachers in her interview, *Different Strokes for Little People* (Bafle, 2009) that:

"It makes much more sense to begin working with responsive teaching in small ways, and building on those over time. Trying to do too much too fast is likely to overwhelm and discourage us. A step at a time, we can do pretty amazing things."

In the same interview, she also advised teachers to accept that they simply cannot differentiate for every student, formerly known as individualized instruction, but rather that they plan differentiated instruction as a way to "look at "ballparks" or "zones" in which students cluster — so that on a particular day, depending on our students and their needs — we might offer two or three or four routes to a goal — not 23 or 30."

**Angela-Math.** Angela successfully recognized "zones" when she differentiated content of her lessons for her math classes. She also recognized, as a middle level 'kid watcher' that they appreciate moving about and music so she successfully included movement and music as a "zone" for differentiation of process. Differentiation of content, process, and product in a math classroom are certainly possible and Angela hopefully will improve in all areas, one step at a time until it is second nature. Many experienced math teachers, not just new teachers, could improve their teaching by focusing on methods to differentiate content, process, and product.

**Sarah-Social Studies.** Sarah understood that middle school students enjoy interacting with each other, as a "zone" and consequently built into her instruction opportunities for students to work together. She also

attempted to provide opportunities for visual learners to succeed, rather than depending on the standard essay, short answer, or other written material that verbal learners prefer. She utilized video and power point presentations to supplement the textbook. Sarah's students, many of whom are ESOL or struggling readers, would benefit from an additional differentiation step to include highlighted texts and graphic organizers for content. In addition, the social studies provides many opportunities to allow students to produce a product utilizing a student contract or choice from products. Again, this is a step that experienced social studies teachers should consider, as well as Sarah.

### **Recommendations for University Teacher Education Faculty and School District Administrators:**

This study was a pilot study with a small sample size. Generalized recommendations should be considered with thought to your unique situation. Some of the findings during this research study might assist you in determining how to better assist new teachers in implementing differentiated instruction.

1. Teacher education programs should include differentiation in all teacher education courses and require field-based evidence of implementation.
2. Teacher education programs should include "real world" examples of how to implement differentiation. Examples include how to develop a learning/interest center when there is little room in the classroom.
3. Mentor teachers for field experiences should include those teachers who can model differentiation.
4. Implementation of differentiated instruction should be viewed as a process, step-by-step, for new teachers with an expectation that some differentiation occurs in all classrooms during the first year.
5. Reduce or remove the barriers to implementation of differentiated instruction. Examples include scheduling an aid in a collaborative classroom on a regular schedule and setting aside time during the school week for teacher and aid in a collaborative classroom to meet and plan; encourage special education teachers, ESOL teachers, and media/technology teachers to proactively offer their support to new teachers, and including new teachers in curriculum teams that develop curriculum maps and instructional strategies.
6. Provide staff development opportunities, especially online staff development that is available with much less cost and without absence from the classroom and "book-talk" groups.



## References

- Bafile, C. (2009). Different strokes for little folks: Carol Ann Tomlinson on differentiated instruction. Retrieved from [http://www.educationworld.com/a\\_issues/chat/chat107.shtml](http://www.educationworld.com/a_issues/chat/chat107.shtml), December 29, 2009.
- Bangel, N., Enersen, D., Capobianco, B. & Moon, S. (2006). Professional development of preservice teachers: Teaching in the super Saturday program. *Journal for the Education of the Gifted*, 29(3), 339-361.
- Brandt, R. (1998) Powerful learning. Alexandria, VA: ASCD.
- Brimijoin, K. Marquisee, E. & Tomlinson, C. (2003). Using data to differentiate instruction. *Educational Leadership*, 60(5), 70-72.
- Burke, J. (2002). *Tools for thought: Graphic organizers for your classroom*. Portsmouth, NH: Heinemann.
- Clayton, M. (2001). *Classroom spaces that work*. Greenfield, MA: Northeast Foundation for Children.
- Cole, R. (1995). *Educating everybody's children: Diverse teaching strategies for diverse learners*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Gartin, B., Murdick, N., Imbeau, M. & Perner, D. (2002). *Differentiating instruction for students with developmental disabilities in the general education classroom*. Arlington, VA: Council for Exceptional Children.
- Gurian, M. (2001). *Boys and girls learn differently*. San Francisco: Jossey-Bass.
- Houk, F. (2005). *Supporting English language learners: A guide for teachers and administrators*. Portsmouth, NH: Heinemann.
- Kajder, S. (2006). *Bringing the outside in: Visual ways to engage reluctant readers*. Portland, ME: Stenhouse.
- Krumboltz, J., & Yeh, C. (1996). Competitive grading sabotages good teaching. *Phi Delta Kappan*, 324-326.
- Levine, M. (2002). *A mind at a time*. New York: Simon & Schuster.
- McTighe, J. and O'Conner, K. (2005). Seven practices for effective learning, *Educational Leadership*, 63(3), 10-17.
- Mertens, S. B., Flowers, N., & Mulhall, P. (2002). The relationship between middle-grades teacher certification and teaching practices. In V. A. Anfara, Jr., & S. L. Stacki (Eds.), *Middle school curriculum, instruction, and assessment* (pp. 119-138). Greenwich, CT: Information Age Publishing.
- Miller, E. (2009). The effect of training in gifted education on elementary classroom teachers' theory-based reasoning about the concept of giftedness. *Journal for the Education of the Gifted*, 33(1), 65-105.
- Moon, T. R. (2005) The role of assessment in differentiation. *Theory into Practice*, 44, 226-33.
- National Middle School Association. (2003). *This we believe: Successful schools for young adolescents*. Westerville, OH: Author.
- O'Connor, K. (2002). *How to grade for learning*. Arlington Heights, IL: Skyline.
- Owocki, G. (2005). *Time for literacy centers: How to organize and differentiate instruction*. Portsmouth, NH: Heinemann.
- Sternberg, R. J. (2006). Recognizing neglected strengths. *Educational Leadership*, 64 (1), 30-5.
- Tomlinson, C. (1995). Deciding to differentiate instruction in middle school: One school's journey. *Gifted Child Quarterly*, 39, 77-87.
- Tomlinson, C. (1998). For integration and differentiation choose concepts over topics. *Middle School Journal*, 3-8.
- Tomlinson, C. (2003). Deciding to teach them all. *Educational Leadership*, 6-11.
- Tomlinson, C. & Kalbfleisch, L. (1998). Teach me, teach my brain: A call for differentiated classrooms. *Educational Leadership*, 52-55.
- Tomlinson, C., Moon, T., & Callahan, C. (1998). How well are we addressing academic diversity in the middle school? *Middle School Journal*, 29(3), 3-11.
- Tomlinson, C. A. (2001a) Grading for success, *Educational Leadership*, 58(6), 12-15.
- Tomlinson, C. A. (2001b). *How to differentiate instruction in mixed-ability classrooms*. (2<sup>nd</sup> Ed.) Alexandria, VA: ASCD.
- Tomlinson, C. A. (2007) Learning to Love Assessment, *Educational Leadership*, 65(4), 8-13.
- Tomlinson, C. A. & Allan, S. D. (2000) Reasons for optimism about differentiation: Its basis in theory and research. In Tomlinson and Allan. *Leadership for differentiating schools and classrooms*. Alexandria, VA: Association for Supervision and Curriculum Development.

Appendix A

Observation Instrument

Date of Observation \_\_\_\_\_

Teacher Observed \_\_\_\_\_

Total Observation time \_\_\_\_\_

General Description of Lesson:

Differentiation of Content	Student Readiness	Student Interest	Student Learner Profile	Notes/Questions  (Specific notes for each tally indicated here to indicate specific strategy and to codify separate incidents of the same process ie) DC R1, DC R2 if two differentiation for readiness examples observed)
Differentiation of Process	Student Readiness	Student Interest	Student Learner Profile	Notes/Questions
Differentiation of Product	Student Readiness	Student Interest	Student Learner Profile	Notes/Questions

Appendix B

Summary of Observations – Frequency Chart  
Occurrences of Differentiation Observed

Angela - Math	Differentiation of Content	Student Readiness	Student Interest	Student Learner Profile	Notes/Questions
		20	1	6	
Angela - Math	Differentiation of Process	Student Readiness	Student Interest	Student Learner Profile	Notes/Questions
		8	2	6	
Angela - Math	Differentiation of Product	Student Readiness	Student Interest	Student Learner Profile	Notes/Questions
		0	0	0	
Sarah – Social Studies	Differentiation of Content	Student Readiness	Student Interest	Student Learner Profile	Notes/Questions
		0	2	8	
Sarah – Social Studies	Differentiation of Process	Student Readiness	Student Interest	Student Learner Profile	Notes/Questions
		4	1	9	
Sarah – Social Studies	Differentiation of Product	Student Readiness	Student Interest	Student Learner Profile	Notes/Questions
		0	0	6	