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Professional Text: Summary and Review

Hamm, Mary, and Dennis Adams. *Differentiated Instruction for K-8 Math and Science: Activities, and Lesson Plans*. Larchmont, NY: Eye On Education, 2008. Print.

Pages: 132

The book *Differentiated Instruction for K-8 Math and Science: Ideas, activities, and lesson plans* is a fantastic insight on how to diversify ones teaching for a various range of students. The topics which are discussed within this paper can raise a good teacher up to be a great teacher simply by incorporating some of these techniques into a classroom. Dennis Adams, one of the co-authors attended Montclair State University as Mary Hamm, the other co-author, attended San Francisco State University. Mary Hamm has published more than ten books and eighty journal articles on these topics. Dennis Adams is an educational consultant who has taught classes at McGill University in Montreal. He is the author of more than twelve books and a hundred journal articles on various educational topics.[[1]](#footnote-1) Some of the topics these authors have explored include: Science, technology, assessment for all students, math, and the idea of tomorrow’s innovators.[[2]](#footnote-2) Most of their books they have written have been together. Thus, their information is broadened and deepened because they are coming from two different background experiences and putting them together. As one can see before even opening this book, the authors are quiet credible and have a vast knowledge in this department of education. There are many splendid ideas within the cover of this book and they are even more credible because they are backed by such reliable authors who have deep experience through their own lives and through an extensive educational background.

Thus, before one even opens the book, we can be confident that the information within is accurate and worthwhile to read because these authors are so accomplished in this field of study. As the pages are turned and one finds themselves at the preface of the book, Hamm and Adams begin by establishing as to why we have differentiation in the fist place. They say it: “builds on the social nature of differentiated learning to provide some practical suggestions for reaching every student in a K-8 classroom”.[[3]](#footnote-3) Having differentiated instruction is the different between having every student in the classroom learning between the grades of K-8 and only teaching to a select group in a classroom. This whole idea behind differentiating instruction is to reach each and every student at the point they are at and help them learn to the best of their abilities as we begin to broaden their pool of knowledge. It goes on to say that this book is to help teachers created a differentiated classroom that is more open to all student as they learn.[[4]](#footnote-4) We as teacher, have an extensive ability to make or break a students experience with learning. If we open our classroom up and give them the opportunity to learn despite their peers having a head start on them, we open up the opportunity to change a life not just a day or year.

This book focuses on the great importance of designing a math and science program that will accommodate to a wide variety of learners with various different backgrounds. When going into a lesson, one needs to know the value of each student’s “preparedness, learning style, interests, and their confidence in learning”.[[5]](#footnote-5) This seems overwhelming to develop a lesson that reaches every single student’s need for each of these things. As we take a deeper look at how this *is* actually possible, the opportunities begin to increase and our abilities to teach students increases like we have never experienced before. As we move through this book together, we will find that there are a wide variety of informative devices included within this book. The book attacks many different aspects of differentiation: math and science, grades K-8, activities for students, and different teaching methods for different types of learners.

The first chapter is an introduction giving an overview of what the book is about as well as give encouragement to teachers to look at all the aspects of their classroom and although it may seem quite daunting to take it one step at a time and we can be successful through any situation of diversifying a lesson. A great quote at the end of chapter 1 says: “To differentiate instruction, you need to clarify the content (what you want students to know and be able to do), the process (how students are going to go about learning the content), and the product (how they show what they know)- Amy Benjamin”.[[6]](#footnote-6) There are three aspects of a lesson that we need to closely look at as we form lesson plans.

As we move into the information of the book there are different suggestions of what differentiation is, what the structure of differentiated instruction is, and how to observe what kind of learners your students are. One of the best principles of differentiation they talked about is the idea of a high-quality engaging curriculum. The curriculum needs to be inviting, consistent, important, and thoughtful.[[7]](#footnote-7) This almost seems like it would be common sense, but the basic idea is that teachers need to change their curriculum almost every year slightly depending on what student requires from year-to-year. At the end of each chapter, there are activities that can be helpful for a teacher dealing with whatever subject is being addressed in that particular chapter. For this chapter, there is a lesson plan on multiple intelligence. This lesson plan addresses the idea of what to do with the students who are all at different levels on knowledge in this certain subject. The chapter then finishes by giving five different activities for students to do based on their level of knowledge with this particular subject. Sometimes we just need some ideas and we, as teachers can take it from there. That is what this chapter seems to be doing, starting us on ideas and we can finish them as we see fit for our classrooms. The ending quote from this chapter says: “What children can do together today they can do alone tomorrow”.[[8]](#footnote-8) This is so fitting for talking about differentiation and meeting students where they are.

The second subject to be addressed in the book is differentiated assessment. This is taking a closer look at how to give assessments to students as they do best in. One of the bolded topics is knowing your students. Although it would be ideal that most students know about an equal level of knowledge after each lesson, that is never the case. If we can look into a students’ learning profile, we will find a way that is useful to assess what we value instead of simultaneously assessing ideas that might not be applicable to every student. An example of a test that would not do justice in capturing the reality of a student’s knowledge is multiple choice testing.[[9]](#footnote-9) This test could be accurate, but there are also always four options therefore giving a student the opportunity to do much better than their real-life knowledge.

One idea for assessment is a portfolio.[[10]](#footnote-10) This is a collaboration of all the information a student has done and the teacher can review what they know and how they improved. Again, this chapter ended with giving the idea of doing an activity and how to differentiate it towards looking at the portfolios of students.

The next item we looked at pertains to the title and examining differentiation in math. Math is an interesting subject because not only will you have differences in background knowledge, but there will be differences in interest and a vast difference in learning styles.[[11]](#footnote-11) Unlike English or science, the information is semi straightforward with only one way to teach the lesson. That is not the case with math. There can be four or five different ways to teach an idea in math. Some students are visual while other students learn better with a hands on activity.[[12]](#footnote-12) Students use math every single day so a subject like this carries a lot of weight that the students learn it to the best of their ability. Another aspect of teaching math and having the student learn it to the best of their ability is that math builds on top of itself. So, if a student does not understand one concept in math they will get behind for the next day is going to build on it and they will fall even further behind. In contrast, science is a subject that if a student does not understand the rock formation within geology they will be alright because the next unit is space and those two subjects have nothing to do with each other. The chapter ends by giving some examples on how to vary teaching math facts to different styles of learning.

Chapter four is all about differentiating science instruction. The approach is the same as during math, but the content is different. Science is an interesting subject because the curriculum is always changing. We can make a discovery and then three years later, another discovery is made that deepens the knowledge on a particular subject.[[13]](#footnote-13) That being said, a teacher needs to be ever changing on the knowledge in the science department. This is not a subject that can be learned once and then retaught over and over for twenty-five years. A teacher, each year should look up and know the current event on scientific information. Hamm and Adams talk about making learning more challenging in this topic of study. There are so many variations for a teacher to make learning more challenging for a student who is exceling in this particular areas of study. This is also a great area of study to help a student who is maybe struggling excel because they can discover and find out for themselves their knowledge.[[14]](#footnote-14) This is a great place for students to discover a love for learning. The chapter finishes out by giving activities, but not only that, it then continues on to give a lesson on how to demonstrate a science experiment to various age groups and how to change the lesson depending on the age group.

The final chapter brings everything together by explaining how to differentiate lesson plans in Math and Science. There are three pivotal questions for a teacher to ask when writing a lesson plan in either one of these areas: “What do I want the students to learn? How are they going to learn it? And How will I know when they have achieved it?”[[15]](#footnote-15) These are some of the questions that each lesson plan should fulfill when writing a lesson plan. A lesson plan should include: “Objectives, procedures, materials, assessment, accommodation, and evaluation”[[16]](#footnote-16). These are pivotal parts that should be included in a lesson plan to successfully teach a lesson. The chapter then goes on to give examples of a lesson plan format. The book finishes by giving examples of different lesson plans for differentiation. There are three examples of the same lesson plan for math and different ways in which it can be taught. There are also three different examples of a science lesson plan and how it can be differentiated for the students.

The book finishes by some final remarks in conclusion with everything that was discussed and explored throughout the book. One quote that was very applicable said that “it is clear that competency in math and science is part of the foundation of human creativity”.[[17]](#footnote-17) Math and science are central to the idea of successfully living in society and as teachers we have such a rare and sweet opportunity to equip our students with the ability to meaningfully live in society and actively contribute. It all starts in the classroom. That can be something that is quite intimidating but so empowering.

Critical Review:

In this text, there were some chapters that I completely agreed with, some chapters I did not agree with, and some chapters that I felt I learned a great deal and received some ideas on how to be a better teacher to a diverse population. In chapter 1, there were principles of differentiation listed. One of the things I learned was the idea of a high-quality engaging curriculum. As we took a closer look at the curriculum that we as teachers choose to teach needs to be inviting, consistent, important, and thoughtful.[[18]](#footnote-18) This resonated with me because I have personal experience with having a quality curriculum and a curriculum that is not as geared toward the students in the class and what they need. For me, I had a teacher in second grade who knew I was a very visual learner so she would teach her lessons and have separate handouts for some of us who were visual learners. She would have different stations for students to go to after we learned a lesson to “explore” the lesson. I did not think anything of it at the time, but I now know that she was greatly differentiating our class. The students who were visual learners “explored” in a different way than the students who were hands on learners.

The second chapter talked about how to give students assessments and how that looks different for each student. I think this is very important for teachers to understand because in my generation, testing looked very similar all across the board. There was not a whole lot of attention paid to the idea of differentiated testing. This book explores the idea of testing kids on knowledge they have learned and find that proof in different ways. One of the ideas was to use a portfolio for the kids who struggle taking tests. I agree with this, but at the same time, I think if we as teachers enable our students to let them “off the hook” for taking official tests, this will only hurt them in the long run. If it was solely based on finding out how much the student knows, then a portfolio will make sense to find out what information they learned. But, we have to be careful not to use this as an opt out for the student to not have to learn to take tests and deal with their anxiety in doing so. I definitely think there is something to be said about a student learning to time manage on a test and learning how to be a smart test taker. All that to say, a portfolio is a great option if the teacher is simply trying to find out what information has been learned, but I would not advise always giving the portfolio option because then the student does not learn how to be a smart test taker or the skills other students learn from tests.

Chapter three was all about teaching to differentiated students in math. I really enjoyed getting to read this chapter because it shed so much light on the many different options for students to learn while teaching one single math lesson. I knew a lot of the differentiation information that Hamm and Adams discussed but it was great to reiterate and have some of these same ideas taught in a different manner. At one point in the chapter there was a lesson on how to teach fractions. It was great to see it outlined how many different ways there really is to teach fractions. The different ways demonstrated took up about 3 whole pages simply giving options on how to teach one of the lessons to each of the different learning styles of students. Again, I know the idea of teaching the same concept many different ways, but it was great to see it all outlined on the pages in front of me and to really get to visually see what they were talking about.

I really resonated with chapter 4 and the topics they discussed. This was all about differentiating science instruction, but beside the science concepts, the teaching points are what really hit me. At one point in the book Hamm and Adams address the idea that with science it is really easy for a teacher to differentiate because science is so hands on and students can essentially learn at their own pace using whatever method works best for them. They then went on to explain that we do need to challenge our students to achieve to the best of their abilities. If they are pushed in a way that will challenge but not force them to quit, a student will learn to be more effective throughout their learning careers than if they are simply taught at grade level. Science is a great opportunity for a teacher to tailor a lesson based on giving a student a challenge and not making it too hard that they simply give up.

Another idea for challenging students to the perfect point of pushing them enough to learn but not beyond their capacity is using a collaborative approach. If the student has the opportunity to collaborate with their peers they will have the opportunity for many different learning styles to all comes together and learn in an effective way. With this learning style, one has to be careful because in some instances, this can result in the “more intelligent” student to take over and complete the entire process. If collaboration is done correctly though, a product will result in being of greater value had each of the students worked on their own because there are more perspectives coming together to complete the assignment. I really did like this idea, but there was a great caution for the teacher to watch her students carefully while in the process of collaboration.

The final chapter gave a lesson plan format for the teacher to have ideas for math and science lessons. This is the portion of the book that I disagreed with. Sure, their lesson plan could be effective but CCU education department has a lesson plan format that I would argue, is much more effective than the option that was given in the book. The lesson plan format from CCU is much more extensive and pays more attention to detail than this given lesson plan. The format given is:

~ state the objectives,

~give the organization and procedures,

~answers the question: **How are you going to get the students involved,**

**~**lesson development, questions, and desired product

~varied endings

One of the lessons was to end with an assessment, one lesson give the idea to end with a group project. They were great options, but the format was flawed because it was so inconsistent. Yes, teaching something that has less detail going into the lesson plan is going to be easier for the teacher to plan, but I would argue that the quality of teaching is going to go down because there is going to be less consistency and the teacher is going to know less of what is being taught. This lesson plan would be great for an experienced teacher, but as a beginning teacher I would not feel entirely confident on teaching multiple lessons on this format of a lesson plan.

To end the book, there were many ideas given on lesson plan examples of various topics. I really did like that because it gave some great ideas of what to teach on and how to differentiate lessons. Overall, this book had some good ideas on differentiation in math and science for grades K-8. I would not say this is the end-all be-all book for educating a new teacher on differentiation instruction in math and science, but there were some good, quality points that were made. I am glad that I took the time to read it and dissect the information that was given in it, but I would not highly recommend this book to my peers to read.

1. "Mary Hamm and Dennis Adams" *OverDrive*. Web. 04 Nov. 2014. <https://www.overdrive.com/creators/184939/mary-hamm>. [↑](#footnote-ref-1)
2. Ibid [↑](#footnote-ref-2)
3. Hamm, Mary, and Dennis Adams. *Differentiated Instruction for K-8 Math and Science: Activities, and Lesson Plans*. Larchmont, NY: Eye On Education, 2008. Print. Page: ix [↑](#footnote-ref-3)
4. Ibid, ix [↑](#footnote-ref-4)
5. Ibid, page: 1 [↑](#footnote-ref-5)
6. Hamm, Mary, and Dennis Adams. *Differentiated Instruction for K-8 Math and Science: Activities, and Lesson Plans*. Larchmont, NY: Eye On Education, 2008. Print. Page: 3 [↑](#footnote-ref-6)
7. Ibid, 4 [↑](#footnote-ref-7)
8. Ibid, 16 [↑](#footnote-ref-8)
9. Ibid, 25 [↑](#footnote-ref-9)
10. Hamm, Mary, and Dennis Adams. *Differentiated Instruction for K-8 Math and Science: Activities, and Lesson Plans*. Larchmont, NY: Eye On Education, 2008. Print. Page: 27 [↑](#footnote-ref-10)
11. Ibid, 43 [↑](#footnote-ref-11)
12. Ibid 45 [↑](#footnote-ref-12)
13. Ibid, 72 [↑](#footnote-ref-13)
14. Ibid, 76 [↑](#footnote-ref-14)
15. Hamm, Mary, and Dennis Adams. *Differentiated Instruction for K-8 Math and Science: Activities, and Lesson Plans*. Larchmont, NY: Eye On Education, 2008. Print. Page: 99 [↑](#footnote-ref-15)
16. Ibid, 100 [↑](#footnote-ref-16)
17. Ibid 131 [↑](#footnote-ref-17)
18. Ibid, 4 [↑](#footnote-ref-18)