

Cases on STEAM Education in Practice: Differentiated Instruction

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EXECUTIVE SUMMARY

This chapter will reflect on the other chapters within the text and have multiple examples of how to differentiate STEAM lessons. Issues that arise such as professional development around differentiated instruction, the time it takes to differentiate (amount of planning), lack of classroom time to complete projects, and lack of support or collaboration with the special education teacher are discussed.

LITERATURE REVIEW

Students differ from one another socially, academically, physically, cognitively, and emotionally. They also learn differently (Gregory & Chapman, 2007). Teachers can no longer just “teach the lesson” and hope that everyone understands. It is important to first take into consideration who each learner is, their strengths and needs, readiness levels, interests, and preferred learning styles (Tomlinson, 2001). This is the first step in differentiated instruction.

Differentiated instruction allows all students to access the same classroom curriculum by providing accommodations tailored to meet their individual needs (Tomlinson, 2001; Watts-Taffe, Laster, Broach, Marinak, Connor & Walker-Dalhouse, 2012). After teachers know, understand, and assess each learner, it is critical to

use that information to design instruction. This can be done through curriculum compacting, grouping, and adjustments to their learning.

Curriculum compacting is a strategy that can sometimes be used if a student has already mastered the content; the teacher then designs the instruction to “dive in deeper” or “compacts it” and moves on to the next skill (Gregory & Chapman, 2007; Logan, 2011). For example, for a first grade student, if the lesson objective is to use observations of the sun, moon, and stars to describe patterns, the student should be able to identify and discuss patterns like how the sun and moon rise in one part of the sky and move across the sky. To compact the curriculum, the teacher would design “deeper instruction” where the student collects data on specific times that the sun rises or data on the location of the sunrise and sunset. The other option for curriculum compacting would be for the teacher to move the student on to the next skill within the curriculum. For example, if they mastered that topic, then the teacher would move the student onto making observations at different times of year to relate the amount of daylight to the time of year (since this is the Next Generation Science Standard) or the next standard that they are going to cover in their curriculum.

An important feature in differentiated instruction is the use of flexible grouping and different grouping strategies. The best instruction is when students have a balance of working alone, with a partner, or in small flexible groups. Flexible grouping is when students are mixed with other students based on their ability and interest level. By incorporating flexible grouping, students “maximize their learning time based on their performance levels” (Gregory & Chapman, 2007). The critical component in flexible grouping is that the students work with a variety of their peers and switch groups often. There are a variety of grouping strategies (see Table 1: Differentiated Grouping Strategies) and, based on the content, the teacher can determine if another grouping strategy would better meet the needs of the students.

The final step in differentiated instruction is making adjustments to students’ learning. This can be done when teachers make adjustments to the content, process, and product. When a teacher differentiates the *content*, the teacher identifies “what we teach or what we want students to learn” (Tomlinson, 2001). There are two ways to differentiate the content: First by adapting “what” we teach. For example, I’m teaching a sixth-grade science class about the solar system. I can differentiate the content because I may have some students first reviewing and relearning the characteristics about the earth while others are working on all of the planets together, in turn, differentiating “what” they learned. The second way to differentiate content is that we can adapt “how we give students access to what we want them to learn” (Tomlinson, 2001). For example, in the same science lesson some students may be reading about the solar system on a sixth grade-level text, some are watching a movie, and others are reading on a fifth-grade level. The access is adapted to how they are acquiring the information.

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