

A Model for Differentiating Instruction in Science Using Tiered Lessons

Cheryll M. Adams, Ph.D.
Ball State University

Center for Gifted Studies
BU 109
Ball State University
Muncie, IN 47306
cadams@bsu.edu

Rebecca L. Pierce, Ph.D.
Ball State University

Department of Mathematical Sciences
RB 436
Ball State University
Muncie, IN 47306
rpierce@bsu.edu

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Problem

At a time when many school corporations and districts across the nation have embraced the inclusionary model of services to a diverse student body, it is vital that teachers have the necessary tools to teach in the inclusionary classroom. While most preservice teachers are required to take a course in diversity and/or the needs of exceptional learners, these ideas have not been infused throughout teacher education programs or inservice professional development. Little attention to diverse learners is given in content area courses or inservice workshops. This paper will describe one model that provides teachers with the background and a template for designing lessons for diverse learners based on readiness, interest or learning style. These lessons address national and/or state standards, key concepts, and embedded assessment.

Background

The notions of understanding individual differences among learners and knowing how to meet their needs are difficult for both preservice and inservice teachers. In an analysis of 83 studies, Veenman (1984) found dealing with individuals differences ranked third out of 24 perceived problems of beginning teachers. McDiarmid (1990), however, contends that preservice teachers believe (1) children deserve an education tailored to their individual needs, and (2) different standards should be applied to different students. Paine=s (1990) insight may resolve this apparent contradiction. He contends that although preservice teachers may hold positive attitudes toward individual differences in pupils in the beginning of their education program, these attitudes change as preservice teachers struggle to control a classroom. In other words, while they may want to do something to honor the diverse

needs of their pupils, they may lack the skills and/or resources to do so.

Clearly, there is a need to provide teachers with tools that allow them to meet the needs of the academically diverse students in their classroom. Differentiated instruction is one such philosophy that allows teachers to respond to the needs of all learners. It is based on the idea that teachers need to adapt instruction to respond to student differences. Teachers may respond to differences in readiness, learning style, and/or interest, within the content, process, or product (Tomlinson, 1999). While there are a variety of strategies that are embraced by this philosophy, this paper will present one strategy, tiered lessons, that, when combined with classroom management, provides a model that allows teachers to implement differentiated lessons designed to meet an array of learner needs. In addition, the model addresses two themes identified by Adams (1994) and Tomlinson et al (1995): the limited knowledge preservice and inservice teachers have concerning differentiation of instruction and differentiated strategies, and their perceived need to cover district curriculum prevents them from addressing students' differing needs. Moreover, the classroom management portion of the model provides a means to address one of the top concerns of preservice teachers in Tomlinson et al's study-- managing student behavior.

The Model

The model is appropriate at any grade level and content area. It weaves together four elements--classroom management techniques, anchoring activities, tiered lessons, and assessment. Managing time and space, flexible grouping, and working individually all require a clearly articulated classroom management plan. Students need to know and understand the rules for both individual and group activities. Anchoring activities provide meaningful work, individual assignments, practice with

specific skills, teacher-selected and student-selected activities. Anchoring activities replace AI'm done≡ thinking with AWhat=s next?≡ In a differentiated classroom, students know to move to their anchoring activities when waiting for the teacher=s attention or when their current work is completed and the class is not yet ready to move as a whole to another lesson. Students know that it is always safe to work on an anchoring activity--they may get redirected later by the teacher, but they won=t get in trouble when doing an anchoring activity.

Tiered lessons provide different paths toward understanding a particular concept. In our tiered lesson template, the teacher always begins with the standard (national, state, and/or local) being addressed. Secondly, the teacher indicates the key concept and the generalization. Teachers choose to modify the content, process, and/or product in the lesson, according to students= learning styles, readiness, and/or interests. The lesson is then differentiated to provide various tiers, or paths, that lead students towards an understanding of the concept and generalization. No matter which path the student takes, understanding the concept and generalization should be the result. Because the lesson has been differentiated, the assessment may also be differentiated. The model addresses both formative and summative assessments.

Contribution to Literature

A search of ERIC over the last ten years yields few studies of preservice teachers dealing with diversity in general and no studies using particular curricular models. There are few that address models with inservice teachers. Since our proposed paper will deal with both issues, we hope to expand the existing literature and provide a clearly articulated model that can be translated into classroom practices. This model provides for classroom management strategies, flexible grouping, and activities that challenge

learners whether they are below grade level, at grade level or advanced. With such a model in their repertoire of teaching strategies, preservice and inservice teachers can readily meet the needs of all learners in the heterogeneous classroom.

Research indicates that preservice teachers adhere to the belief that one lesson must be designed to suit the largest number of students possible. (Tomlinson et al, 1994, Tomlinson et al, 1995). Along with their inservice counterparts, they often naively assume that differentiation of instruction means assigning students to heterogeneous cooperative groups in which the high ability students become the Ateachers,≡ and the lower ability students become the Alearners.≡ When instruction is truly differentiated, all students engage in meaningful, respectful work at a level that provides a moderate challenge for them. For differentiation of instruction to occur successfully, the teacher moves from being the dispenser of knowledge to a facilitator of knowledge; the student moves from consumer of knowledge to producer.

Learner/Participant Outcomes

During this session, the model will be presented. We will discuss each element and provide examples of the elements. Participants will receive a template for lesson construction using the tiered structure as well as actual completed lessons for their use. Participant goals are knowledge of the model and its components, awareness of its use in the classroom, and its value as a part of the instructional strategies used by both preservice and inservice teachers. Unfortunately, session time constraints will not permit practice writing lessons with the model.

Presentation Methods

We will briefly present the background and research data using a variety of media, such as,

PowerPoint, discussion, and handouts. We will provide examples of completed lessons at three grade levels, elementary, middle, and high school, that can be shown on an overhead projector with handouts available for the participants. We plan to engage the audience through a discussion to provide feedback, since we are most interested in their opinions about using the model in teacher education classes.

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