Spring 2009

Learning-Styles-Based Differentiated Instruction

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Abstract
The authors place the Dunn and Dunn Learning Styles Model in the larger context of differentiated instruction. They provide a brief theoretical and practical overview of the model and conclude with stating several crucial factors contributing to its viability.

Introduction

The term "differential instruction" is believed to be coined by Ward (1961) in reference to modifying classroom instruction to respond to the needs of gifted students. Since then, both the definition and the scope of differentiated instruction have expanded greatly, now including gifted, high-achieving, average-achieving, and low-achieving students, learners with special needs and those for whom English is a second language. According to Tomlinson (2001), teachers working with such diverse student population need to be able to:

1. Differentiate the content or topics –What is the content that most intrigues youngsters?
2. Differentiate the process/activities—In what type of alternative learning activities can students participate?
3. Differentiate the product--How can students show that they mastered the required materials?
4. Differentiate the environment— How can all learners achieve maximally by adjusting the learning environment and using materials that are conducive to content mastery, better retention, and improved attitudes toward learning?

One dimension of most differentiation of instruction models connects learning styles to the consideration of students' learning profiles and preferences of instruction. Learning styles and learning preferences are often used interchangeably (Dunn & Dunn, 1992). According to Sternberg and Grigorenko (1997) the concept of learning styles—the understanding that individuals acquire new and difficult information or skills in different ways—emerged from cognitive-style research in American education at about the same time. In the past 40 to 50 years, numerous learning styles models, identification instruments, research- and practitioner-oriented articles, book chapters, and books have emerged on the topic. During the past 20 years, differentiated instruction and learning styles have become widely researched and implemented in classrooms around the United States and throughout the world because of the recognition that students' individual needs, strengths, and learning preferences encouraged educators to individualize their instruction. First Dunn and DeBello (1999), then Dunn and Griggs (2004) found that the practices based on this construct have led to significantly increased standardized achievement test scores across the nation.

Overview of Learning Styles

Many learning-style models emerged in the past few decades, most of them assessing students' perceptual strengths or processing-style preferences on a dichotomous scale. Kolb (as cited in Jonassen & Drabowski, 1993) based his model on a four-stage experiential learning cycle: concrete experience (CE), reflective observation (RO), abstract conceptualization (AC), and active experimentation (AE), resulting in four learning styles: Abstract, Concrete, Active and

Reflective learning styles based on how individuals engage in the world. Based on Kolb, McCarthy (1997) identified four learning types of learners: imaginative, analytic, common-sense, and dynamic based on how they approach the learning process. Grasha and Reichman (1975) defined learning styles as personal qualities and identified six basic learning style preferences: avoidant/participant, competitive/collaborative, and dependent/independent.

The Dunn and Dunn Learning-Style Model

The Dunn and Dunn Model approaches learning styles from a more complex, more comprehensive perspective considering multiple dimensions of preferences defined as a learner's strength. A personal interview we conducted with Professor Rita Dunn [R. Dunn, personal communication, August 4, 2006] revealed how learning-style differences emerged for her in the 1960s. As she reminisced, a classroom of baby boomers came alive depicted in her words. She recalled that, "It wasn't until I sat in the rear of a classroom, while another teacher taught that I actually could see how individual children's concentration behaviors varied. I suddenly noticed how some:

- Shaded their eyes while doing assignments;
- Covered their ears while concentrating;
- Shuffled their feet back and forth or discarded their shoes while thinking;
- Nibbled on snacks, bit their fingernails, toyed with hand-held items, and commented to classmates while simultaneously listening to their teacher;
- Came alive when permitted to work with classmates on tasks;
- Argued with classmates when required to work together;
- Questioned directions they had just been given and accepted;
- Asked permission to do assignments differently from how they had been told to do them;
- Did not remember what the teacher had said two different times in two different ways just moments before;
- Did not remember--or even understand--what they had just read aloud to the group;
- Moved in their chairs repetitiously, sat on their ankles, knees, or hands, and occasionally fell out of their seats;
- Did not remember directions told to them or written on the board; or
- Sang or talked to themselves while taking tests."

These observations depicted a classroom of unique individuals whose varied needs went largely unacknowledged and most likely unappreciated. These personal observations and insights also led to Rita Dunn and her husband Kenneth Dunn's early investigations into learning differences and the ultimate emergence of the Dunn and Dunn Model. Today, more than 800 studies have focused on the Dunn and Dunn Model. Those publications have documented that individuals learn in significantly different ways, and that learning-style-responsive instructional approaches statistically increase students' acquisition of new and difficult skills and information (Dunn & Griggs, 2004; Research on the Dunn and Dunn Model, 2007)

What Constitutes the Model's Theoretical Background?

The Dunn and Dunn Learning Styles Model emerged from cognitive style theory, brain-lateralization theory, and practitioners' observations. Over the past three decades, several new elements have been added to the twelve initially identified variables. According to the Dunns, "learning style is a biological and developmental set of personal characteristics that make the identical instruction effective for some students and ineffective for others" (1992, p. 4).

What does the Model Look Like Today?

At its conception in 1967, this learning styles model encompassed only a few of its current elements (light, temperature, time-of-day, seating design, motivation, perceptual strengths,

responsibility, intake, sound, mobility, and structure).The model has evolved from the original 12 elements to 20 classified into five stimulus strands. These elements include students' (a) immediate environment (sound, light, temperature, and furniture/ seating designs); (b) own emotionality (motivation, persistence, responsibility [conformity versus nonconformity], and need for either externally imposed structure or the opportunity to do things in their own way); (c) sociological preferences (learning best alone, in a pair, in a small group, as part of a team, with either an authoritative or collegial adult, and with variety as opposed to patterns and routines); (d) physiological characteristics (perceptual strengths, time-of-day energy levels, and need for intake and mobility while learning); and (e) processing inclinations (global/analytic, right/left, and impulsive/reflective). Although this model consists of multiple elements, most individuals would be affected by only between 6 and 14 of the 20; some fewer and some by as many as 17. Only those specific elements that impact each individual comprise that person's learning style (Dunn & Dunn 1992, 1993, 1999).

Is There Research to Support the Model?

During the past four decades, extensive research emerged from the Dunns and other researchers at more than 125 institutions of higher education throughout the world (Dunn & Dunn, 2005). To investigate connections between individual preferences and other aspects of learning, many researchers conducted studies to determine the relationships between learning style and achievement, adolescents in many nations, aging, attitudes toward school, birth order, career uniqueness, classroom and home environments, cognitive development, conformity/nonconformity stages, cooperative earning, family members, field dependence/ independence, gender differences and similarities, global/analytic processing-styles, hemisphericity, instructional strategies, leadership, national trends, multicultural groups, multiple intelligence, perception, personality, self-concept, small-group and teamed learning, social preferences, staff development, and temperament.

Numerous studies examined learners at all levels from pre-school through adulthood and aging. They differentiated among adolescent psychiatric, at-risk, average, creative, dropout, gifted, international, non-traditional, reading-disabled, special education, talented, truant, and underachieving populations (Research on the Dunn and Dunn Model, 2007). They tested consistency of learning style over subject matter and time and described how styles tended to change among some people—but not among others. In correlational studies, researchers explored the similarities between and among culturally diverse groups and revealed traits common among students in the same age or grade and among those with similar talents, achievements, and interests. In extensive experimental research, investigators demonstrated the positive impact that accommodating learning-style preferences had on achievement, attendance, attitudes, behavior, and attendance--especially among underachievers and average students (Research on the Dunn and Dunn Model, 2007).

What are the Practical Implementations of the Model?

Practicing educators are most concerned about the applicability of any theoretical construct. How can learning-style-responsive strategies be implemented at any grade level? The Dunns (1992, 1993, 1999) and Dunn, Dunn, and Perrin (1994) and most recently Dunn and Honigsfeld (2009) identified seven main instructional approaches to respond to learning-style differences found among any group of learners, at any grade or age level, in any type of institutional setting, and in any geographical location:

Tactual Resources. Learning Circle, Task Cards, Electroboards, Wrap-Arounds, Pick-A-Holes, Flip Chutes and many other hands-on instructional resources are ideal for students who need to lean by actively manipulating learning materials as they encounter new and difficult information.

Kinesthetic Resources. These resources or activities involve whole-body or large-muscle movement and actively engaged learning opportunities, thus benefiting students who can't sit still and seem to be hyperactive, but whose perceptual strengths do not respond to

traditional audio-visual presentations. Students develop knowledge and skills related to the target subject as they move about the classroom with decorum and discipline while completing specific tasks directly related to required instructional objectives. Floor games and other kinesthetic activities are designed to be self-corrective, fun, and engaging so that learning occurs in a relaxed, game-like setting.

Small-Group Techniques. Peer-oriented students benefit most from participating in small-group learning activities such as Brainstorming, Case Studies, Circle of Knowledge, Role Playing, or Team Learning in which they collaboratively investigate a topic, solve a problem, or review material. The paired or small-group instruction can be adjusted to accommodate varied learning-style preferences.

Contract Activity Package (CAP). One of several learning-style responsive instructional approaches, CAPs are ideal for gifted or nonconforming students who need to follow a mutually agreeable format that offers multiple choices of activities, reporting alternatives, and instructional resources.

Programmed Learning Sequences (PLS). A PLS constitutes another learning-style responsive approach for persistent learners in need of structure who also are tactual and/or visual. Such students benefit from this organized, sequential presentation of the content that begins globally, is arranged in a series of frames that provide immediate feedback peppered with humor and illustrations, and intercepted with periodic tactual resources for reinforcement.

Multisensory Instructional Packages (MIP). MIPs are ideal for learners who need multiple perceptual input through varied activities to maintain interest. They reinforce objectives that need to be mastered through highly motivating resources that provide frequent reviews in many different ways. An MIP consists of at least four different tactual resources, a Contract Activity package, a Programmed Learning Sequence, and a Floor game. Auditory support is available through a CD or other voice recording that contains the text of the PLS and CAP.

Traditional Instructional Techniques. Last but not least, traditional lectures, audiovisual resources, whole-class discussions based on assigned readings, and projects or portfolios may continue to benefit highly analytic and conforming learners.

What does the Future Hold for the Model? The Next 40 years....

In light of the complexity of differentiated instruction, the multitude of learning-style models, and the long history of learning styles in the field of education, the inevitable question arises: What is unique about the Dunn and Dunn Model that allows it to continue to impact classrooms across the country and internationally despite misconceptions about, and, criticism of learning styles, inconsistencies among the models in the field of education, the diversity of conceptual frameworks posed, and the many fads and trends that occur periodically in education? In a large scale, qualitative study, Parris (2004, 2008) found that several crucial factors have contributed to its perseverance such as (a) applicability, (b) comprehensiveness, (c) celebration of individuality, (d) research-based investigations, (e) social-change agent role, (f) appreciation of innovative leadership, (g) cultural relevancy, (h) unifying framework through structure and language, and (i) validation of experiences. When the quality of instruction has not successfully met the needs of students, differentiated instructional practices such as learning-style-responsive instruction and resources provide a mechanism for affecting change and facilitating students' academic success.

Conclusions

Teacher educators, school leaders and administrators have encouraged diversification, differentiated instruction, and/or individualization instruction. However, teachers sometimes tend to teach as they were taught—traditionally through lectures, discussion,

and "chalk and talk." Incorporating learning styles is a viable alternative to conventional teaching, enabling teachers to reach students through their preference to learn, supporting research that students learn differently from each other according to age, gender, achievement levels, brain processing, and perceptual strengths. Learning styles responsive instruction represents a possible avenue to differentiation of instruction. As such, it is both nonjudgmental and nonthreatening. As the Dunn and Dunn Model's creators, other researchers and school-based practitioners advocate, there is no one best way to learn, and that no learning style is superior to any other. This perspective is best summarized by critically reflecting on the following: if students do not learn the way we teach them, we must teach them the way they learn (R. Dunn, personal communication, August 8, 2008).

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