
Differentiated Instruction: A Road to Meaningful Learning

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Our schools utilize mainly linguistic and logical teaching methods to impart information. It also uses a limited range of learning and teaching techniques. Many schools still rely on classroom and book-based teaching, much repetition, and pressured exams for reinforcement and review. When students are active in learning process it encourages for reflective thought, creative response, and unique commentary. Students will process and challenge the information they hear or seek though personal discovery. This method allows students to make “sense” of what they learn in class and to give the new information meaning. Differentiation means tailoring instruction to meet individual needs. Teaching the same material to all students using a variety of instructional strategies. Teacher differentiates by modifying the content, the process, the product and learning environment. This paper highlights that differentiated learning cater the needs of students with diverse learning styles Student initiated experimentation and invention are encouraged in differentiated instruction. One important practice is it link the indoors with. outdoors for movement to stimulate the uptake of oxygen, which has a positive effect on learning. Learning styles speaks to the understanding that every student learns differently. Technically, an individual’s learning style refers to the preferential way in which the student absorbs processes, comprehends and retains information. It also explains the process that takes place in brain while learning concepts through differentiated instruction.

Keywords: Meaningful Learning, Information, Teacher and Learning Styles.

Introduction

How human beings learn is an extremely complex process. Learning is a continuous process, a lifelong commitment to knowledge. The exponent of multiple intelligence Howard Gardner (1993), describes intelligence as the bio-psychological potential to process information in certain ways in order to solve problems or fashion products that are valued in a culture or community. The big question to think over is whether our school education is successful in producing smart intelligent people as their products.

The saddest thing is that even today Lecture continues to be the most widely used method in the classrooms. According to Gardner the biggest mistake of past centuries in teaching has been to treat all children as if they were variants of the same individual and thus to feel justified in teaching them all the same subjects in the same way. Our schools utilize mainly linguistic and logical teaching methods to impart information. It also uses a limited range of learning and

teaching techniques. Many schools still rely on classroom and book-based teaching, much repetition, and pressured exams for reinforcement and review.

Active learning

According to Piaget (1973) to understand is to discover, or reconstruct by discovery, and such conditions must be complied with if in the future individuals are to be formed who are capable of production and creativity and not simple repetition. When students are active in learning process it encourages for reflective thought, creative response, and unique commentary. Students will process and challenge the information they hear or seek through personal discovery. This method allows students to make “sense” of what they learn in class and to give the new information meaning. Countless studies indicate that students retain the most by teaching others, practicing by doing, and discussing in groups. Immediate, active use of learning is clearly the best means of retaining information (Sousa, 1995).

Differentiated Learning

Differentiated instruction is defined as “a philosophy of teaching that is based on the premise that students learn best when teachers accommodate the differences in their readiness levels, interest, and learning profiles” (Konstantinou-Katzi et al., 2012, p. 333). It means tailoring instruction to meet individual needs. Teaching the same material to all students using a variety of instructional strategies. Teacher differentiates by modifying the content, the process, the product and learning environment. Student initiated experimentation and invention are encouraged in differentiated Instruction. One important practice is, it links the indoors with outdoors for movement to stimulate the uptake of oxygen, which has a positive effect on learning. Another is it creates a rich stimulating environment through hands-on activities and classrooms with rich colors, textures and students’ work to indicate “ownership” of knowledge (Lackney, 1998). Earlier studies by Greenenough, et al., (1993) and Karni, et al. (1995), indicated that an enriched (stimulating) environment affects growth in the brain.

Content differentiation means it should include both lower order thinking skills and higher order thinking skills. Remembering, understanding, thinking applying, analyzing, evaluating and creating. Differentiation is a teacher’s response to a learners need. Product is what the student creates at the end of a lesson to demonstrate the mastery of the content.

Different learning styles should be satisfied. Student has an individual learning style. Each student has a preferred learning style and successful differentiation includes delivering the material to each style. Differentiation in learning environment includes various types of furniture. Arrangement to support both individual and group work. Differentiated learning satisfies all types of learners. Students take responsibilities. Teachers who differentiate are teachers who consider student learning preferences, abilities, styles and interests.

Differentiated Learning and Learning Styles

Differentiated learning cater the needs of students with diverse learning styles. Learning styles” speaks to the understanding that every student learns differently. Technically, an individual’s learning style refers to the preferential way in which the student absorbs, processes,

comprehends and retains information. Learning Style can be defined as “the way that he or she concentrates on, processes, internalizes, and remembers new and difficult academic information or skills” (Shaughnessy).

This notion of individualized learning styles has gained widespread recognition in education theory and classroom management strategy. Individual learning styles depend on cognitive, emotional and environmental factors, as well as one’s prior experience. In other words: everyone’s different. It is important for educators to understand the differences in their students’ learning styles, so that they can implement best practice strategies into their daily activities, curriculum and assessments. To meet those needs, teachers need to change materials, instructional procedures, and also means of assessment (Southall, 2013).

Many studies were conducted to understand the learning styles of students. David A. Kolb was an American educational theorist who outlines two related approaches toward grasping experience: Concrete Experience and Abstract Conceptualization, as well as two related approaches toward transforming experience: Reflective Observation and Active Experimentation. According to Kolb's model, the ideal learning process engages all four of these modes in response to situational demands; they form a learning cycle from experience to observation to conceptualization to experimentation and back to experience. In order for learning to be effective, Kolb postulated, all four of these approaches must be incorporated.

Peter Honey and Alan Mumford adapted Kolb's experiential learning model. First, they renamed the stages in the learning cycle to accord with managerial experiences: having an experience, reviewing the experience, concluding from the experience and planning the next steps.

Second, they aligned these stages to four learning styles named-Activist, Reflector, Theorist and Pragmatist. Walter Burke Barbe and colleagues proposed three learning modalities (often identified by the acronym VAK): Visualising modality, auditory modality and kinesthetic modality. The VAK learning style uses the three main sensory receivers: Visual, Auditory, and Kinesthetic (movement) to determine the dominant learning style. It is sometimes known as VAKT (Visual, Auditory, Kinesthetic, & Tactile).

In the 1980s, the National Association of Secondary School Principals (NASSP) formed a task force to study learning styles. The task force defined three broad categories of style—cognitive, affective, and physiological and other 31 variables, including the perceptual strengths and preferences from the VAK model of Barbe and colleagues, but also many other variables such as need for structure, types of motivation, time of day preferences, and so on.

Generally, the Seven Learning Styles identified are

- Visual (spatial): learner prefer using pictures, images, and spatial understanding.
- Aural (auditory-musical): learner prefer using sound and music.
- Verbal (linguistic): learner prefer using words, both in speech and writing.
- Physical (kinesthetic): learner prefer using your body, hands and sense of touch.
- Logical (mathematical): learner prefer using logic, reasoning and systems.
- Social (interpersonal): learner prefer to learn in groups or with other people.
- Solitary (intrapersonal): learner prefer to work alone and use self-study.

Learner's preferred styles guide the way they learn. It also changes the way of internally representing experiences, the way to recall information, and even the words chosen. Visual learners understand and learn best when information is presented to them visually. Seeing information helps these students visualize concepts taught.

Auditory Learners understand and learn best when information is presented to them in an auditory manner. Hearing information helps these students internalize concepts taught.

Kinesthetic Learners understand and learn best when information is presented to them kinesthetically. Using their hands or bodies helps these students experience the concepts taught. Children receive information through these three channels all day long and as children get older and develop, one channel will easily facilitate acquisition better than the others. While students can have a mixture of styles and learn in all of the ways mentioned above, each child will most likely have one style that is dominant for taking in new material in the classrooms.

Neuroscience of Differentiated Learning

Our brains are fascinating, intricate structures, with unique complexities. Altogether, the human brain contains 100 billion nerve cells that make 1,000 trillion synaptic connection points with one another (D'Arcangelo, 1998). We are constantly organizing and reorganizing our brains, changing both the physical structure of the brain and the knowledge we hold (Bransford and Cocking, eds, 2000)

Learning is the formation of new synapses and dentrite branching (Zull, 2002). It appears that learning is enhanced when multiple neural pathways are activated at the same time. In plain terms, the more we can activate students' brains in different ways, the more they learn.

This means that engaging as many sensory, cognitive, emotional and social processes in students will increase their learning potential. This can be accomplished by adopting a teaching strategy that provide variety in sensory experiences. For optimal learning to occur, the brain needs conditions under which it is able to change in response to stimuli (neuroplasticity) and able to produce new neurons (neurogenesis). The most effective learning involves recruiting multiple regions of the brain for the learning task. These regions are associated with such functions as memory, the various senses, volitional control, and higher levels of cognitive functioning.

Cognitive functions associated with the lower levels of Bloom's taxonomy such as understanding and remembering, are associated with the hippocampus (the area of the brain responsible for memory and spatial awareness). The higher-level cognitive functions of Bloom's taxonomy, such as creating, evaluating, analyzing, and applying, involve the cortical areas responsible for decision-making, association, and motivation.

The hippocampus is centrally located, meaning that it can connect with various cortical regions throughout the brain. Cortical regions are the outside layer of the brain, where all higher order processes take place. More complex thought processes are more beneficial for learning because they involve a greater number of neural connections and more neurological cross-

talk. Differentiated Learning takes advantage of this cross-talk, stimulating a variety of areas of the brain and promoting memory.

When we learn new information, neurons that code for different aspects of this information begin firing at the same time and “wire together” as a result, physically connecting pieces of older knowledge to create new knowledge. When neurons are firing at the same time, this sends a signal that the two areas (or groups of neurons) are responding to the same information source, and the two areas or clusters should ‘meet’.

But if these neurons firing at the same time are nowhere near each other than hippocampi will help to physically connect these distant neurons. First, the hippocampus connects to the cortical regions that are firing together (e.g., perceptual, linguistic, emotional, etc.). Over time, the hippocampus facilitates a direct connection between the two cortical modules, or clusters of neurons, and the specific memory no longer depends on the hippocampus. The memory is now permanently stored in our cortex, or the outer layer of our brain.

In this way, memories get permanently stored throughout the brain. In summary, as more brain areas are activated, there are a higher number of cortical modules the hippocampi have to connect. This, in turn, makes memories more deeply embedded in the brain, and more easily retrievable. While passive learning may lead to a weak connection between neurons, active multisensory learning leads to deeply embedded neural connections. Providing variety in sensory experiences during learning helps to make learning more interesting and lasting.

Differentiated Learning Experience

The world is dynamic and the horizons and landscapes are changing so do the teachers’ needs and skills. Today’s educators have to respond to diverse populations of students within the general education classrooms. In order to satisfy auditory learners, the teacher may begin new material with a brief explanation and the explanation may be concluded with a summary of what has been covered. Socratic Method of lecturing by questioning learners to draw as much information from them as possible may be use.

Auditory activities, such as brainstorming, buzz groups etc. should be used for providing meaningful learning experience. Students should be given enough time to debrief activities. This allows them to make connections of what they learned and how it applies to their situation. Maintaining an internal dialogue between teacher and the learners is very useful in such a learning environment.

Auditory learners often talk to themselves. They also may move their lips and read out loud. They may have difficulty with reading and writing tasks. They often do better talk to a colleague or a tape recorder and hearing what was said. Teachers should integrate these features style into the learning technique.

Visual learners have two sub channels linguistic and spatial. Learners who are visual-linguistic like to learn through written language, such as reading and writing tasks. They remember what has been written down, even if they do not read it more than

once. They like to write down directions and pay better attention to lectures if they watch them. Learners who are visual-spatial usually have difficulty with the written language and do better with charts, demonstrations, videos, and other visual materials.

They easily visualize faces and places by using their imagination and seldom get lost in new surroundings. To integrate this style into the learning environment teachers may use graphs, charts, illustrations, or other visual aids. Outlines, concept maps, agendas, handouts, etc. May be utilized for reading and taking notes. Students may be encouraged to refer books other than text books. Charts, PPT's, Maps etc. should be used to explain concept. Supplement textual information with illustrations should be given whenever possible.

Kinesthetic learners do best while touching and moving. It also has two sub-channels: kinesthetic (movement) and tactile (touch). They tend to lose concentration if there is little or no external stimulation or movement. When listening to lectures they may want to take notes for the sake of moving their hands. When reading, they like to scan the material first, and then focus in on the details (get the big picture first). They typically use color high lighters and take notes by drawing pictures, diagrams, or doodling. To integrate this style into the learning environment.

Teachers should use activities that get the learners up and moving. Playing music, Using colored markers to emphasize key points on flip charts or white boards, Giving frequent stretch breaks (brain breaks), Encouraging to use high lighters, colored pens and/or pencils, Encourage learners to transfer information from the text to another medium such as a keyboard or a tablet or to prepare ppt or draw the verbally explained concepts using concept maps etc. can be done to sustain their interest in learning. Field visit and providing motor activities also enhance their understanding level of concepts.

Further, Howard Gardner's theory of multiple intelligences identified eight distinct intelligences: linguistic, logical/mathematical, musical, bodily -kinesthetic, spatial, interpersonal, intrapersonal and naturalist. This is important when looking at how students possess different kinds of minds and therefore learn, remember, perform, and understand in different ways.

He argues that students would be better served if teachers could teach in a number of ways and learning could be assessed through a variety of means. This might reach more students and improve content retention. Learning preferences extends these ideas by effectively instructing a larger number of students to encourage the development of the less preferred style.

Conclusion

Successful learning happens only when a concept is presented in such a way that all the learners who learn it with different learning style find it meaningful and interesting. It allows learners the opportunity to become involved. All the students have the same learning goal. But the teaching approach varies depending on how students prefer to learn. Instead of using a one-size-fits-all approach, a teacher uses a variety of methods to teach.

This can include teaching students in small groups or in one-on-one sessions and incorporating various learning strategies to present a content. Differentiated instruction allows students to show what they know in different ways. It can work well in general education classes that include students with learning and attention issues. The goals of differentiated instruction are to develop engaging tasks that challenge and enhance learning for each student.

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