Lecture 6

Book: Students with Learning Disabilities

Chapter 6 : Teaching Theories and Practices

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Summary

Information processing theory: Information processing theory focuses on what and how information is acquired. Information processing theorists examine how people select, extract, maintain and use information in the environment. The components of information processing are as follows:

- Sensory memory: It refers to the portion of memory that receives information from the environment. Information is stored there only long enough for it to be processed; it is then stored temporarily in short term memory.
- Short term or working memory: After information is received in sensory memory, it moves to short term memory where a process of integration takes place. At this stage, the learner draws on prior knowledge in long term memory to evaluate the stimulus (information) and the context of the stimulus. Once information is retrieved from long term memory, it is held temporarily so that it can be manipulated. This holding tank is called short term or working memory and supports integrative processing. Short term memory has a limited capacity. Information processed in short term memory is either forgotten or stored in long term memory.
- Long term memory: It does not have a limited capacity. It contains all of the information that an individual has learned; it can be thought of as "acquired knowledge". Cognitive psychologists propose that there are three types of knowledge. 'Declarative knowledge' sometimes known as semantic knowledge, describes the information commonly thought of as concepts and facts. This knowledge is memorized for tests, contributed in conversation and retrieved to answer questions and solve problems. 'Procedural knowledge' describes the steps involved in carrying out activities or performing tasks. It includes fluent operations such as those involved in decoding a word, kicking a soccer ball, tying a shoe or making an outline. However, once the procedure is understood and can be applied and described, then it is considered to be both declarative and procedural

knowledge. 'Conditional knowledge' is the information about when and why to integrate procedural and declarative knowledge in the process of learning. Meta cognitive strategies or executive strategies are considered to be aspects of conditional knowledge and are a feedback mechanism related to "how things are going" in the learning process. The ways in which the individual organized information is called "schema". Some cognitive psychologists believe that individuals store relevant or associated information together in schema. Therefore, related declarative, procedural and conditional knowledge can be thought of as being "packaged" together.

- Executive processing: Another set of processes that serve as a foundation to the information-processing system relates to the individual's ability to monitor, regulate, and evaluate learning and performance. These processes which are important in making the overall information processing system work are stored in the long term memory and controlled by the learner. The terms 'feedback', 'executive processing', 'meta cognition' are often used synonymously. Educationally, these processes are thought of as the ability to self-question.

- Contextual demands: This dimension relates to the demands placed on the learner to respond. In essence, response demands reflect the challenges posed in the learning task. Information processing models acknowledge the environmental influences on the learner through this aspect of the model. In other words, information is processed in a context. This component of the model reflects the fact that the learner must evaluate what is required in a learning task to know how to process the information and form the expected response within the context of the situation and the setting.

Information processing theory and learning disabilities:

- Memory processes and students with learning disabilities: Studies have shown that students with learning disabilities have more difficulty with visual, short-term memory tasks than do their peers without learning disabilities. The memory problems of individuals with learning disabilities are attributed to the limited use of cognitive strategies e.g. organization and rehearsal. When these cognitive strategies are taught to individuals with learning disabilities, their performances are similar to those of others. Some studies indicate that students with learning disabilities differ from students without learning disabilities in the basic information stored in long term memory.

- Higher order v.s. lower order processing: Many students with learning disabilities have primarily higher order processing difficulties. They do not seem to apply strategies that lead to effective and efficient responses to demands encountered across settings. The control they exert on promoting or guiding their own learning is minimal. Other research also focuses on lower order processing. Such as studies on phonological processing

which relates to an individual's awareness of and access to the sound structure of language.

Implications for use of information-processing theory: People with learning disabilities who have difficulty with higher order mental functions are considered to be inactive learners, strategy deficient or insufficiently strategy oriented during learning. Studies show that students with learning disabilities have difficulty with this level of information processing. For e.g. in some studies immature students and students with learning disabilities did not appear to use active strategies for learning or problem solving. It is believed this failure results in part from an inability to generalize a previously learned problem solving strategy to a new problem. Efforts to train students with learning disabilities to use specific congnitive strategies to improve learning have been successful esp. when training is given in both cognitive and metacognitive aspects of the strategy.

Translation of information processing theory into practice: The process of translating theory into practice must focus on how instructional principles can be organized to affect classroom practice systematically and reliably. A teacher's instructional procedures should be designed to interrupt an existing information processing sequence, if necessary, and to externally guide or prompt the student's strategic processing of information more efficiently and effectively than would be possible if the learner proceeded alone. These 3 steps are useful:

1) The learner must be oriented to the instructional situation by
   ➢ Becoming aware that a learning situation or opportunity exists.
   ➢ Attending to the new information.
   ➢ Drawing on appropriate prior knowledge to contextualize or make logical associations with the new information.
2) The learner begins to understand the information by
   ➢ Identifying concepts.
   ➢ Identifying similarities between different examples indicating that they do or do not belong to the same concept class.
   ➢ Making appropriate associations with prior knowledge regarding these concepts.
   ➢ Distinguishing between important and unimportant pieces of information in the reconstruction of the knowledge base.
3) The learner must act on the new information by
   ➢ Testing the knowledge and its effect in the real world.
   ➢ Exploring the various dimensions of the knowledge across situations, settings and conditions.
   ➢ Applying the knowledge to solve problems
   ➢ Using self practice and memorization activities to ensure that knowledge is available for later access.

Instructional Approaches:

- Behavioral approach: It is based on the premise that the environment greatly influences behavior. The behavioral approach includes behavior modification, applied behavior analysis, task analysis, data-based instruction and direct instruction. The assumptions shared by behaviorists are the following:
  i) All behavior is influenced by the principles of learning (e.g. positive reinforcement)
  ii) Interventions focus directly on the behavior of concern e.g. reading comprehension, out of seat behavior etc.
  iii) Teaching objectives are specified, and target behaviors are observable and measurable.
  iv) Student progress data determine the effectiveness of interventions and guide instructional decisions.

The essential components of behavioral approach are as follows:

- Direct instruction: according to the University of Oregon conceptualization of direct instruction is defined as follows "It is a complex way of looking at all aspects of instruction – from classroom organization and management to the quality of teacher student interactions, the design of curriculum materials, and the nature of inservice teacher training. The key principle in direct instruction is deceptively simple: For all students to learn, both the curriculum materials and the teacher presentation of these materials must be clear and unambiguous. While many writers treat curriculum design and effective teaching research as separate strands, practitioners play them in concert. Direct instruction comprises six critical features: (a) an explicit step by step strategy (b) development of mastery at each step in the process (c)strategy or process corrections for student errors (d)gradual fading from teacher directed activities toward independent work (e) use of adequate, systematic practice with a range of examples (f)cumulative review of newly learned concepts." In direct instruction, the organization and assessment of academic skills are highly structured. Instruction concentrates either on a terminal academic behavior e.g. reading comprehension, or on subskills considered to be prerequisites for learning the terminal behavior.
- Data based instruction: In data based instructional approaches, student's progress is monitored frequently and instructional decisions are based on the student's performance on the measures. A technique within this model, the curriculum based measurement (CBM) refers to the use of specific procedures whereby a student's academic skills are assessed through the use of repeated rate samples using stimulus materials taken from the student's curriculum. Its primary use is to establish district or classroom performance standards, identify students who need special instruction and monitor individual student progress toward long range goals. One of the most important features of data based instruction is its emphasis on direct and continuous measurement of behavior. direct measurement entails on focusing on relevant classroom behaviors. Repeated measurement requires that a behavior be counted and recorded over a period of time. For

data to be useful, the information must be displayed in an easy to read format. This involves creating a visual display so that raw data can be analyzed. Graphing is the most common method of presenting data.

The cognitive approach: Cognitive approaches evolved from the belief that the learner is the critical agent in how information is processed in response to learning demands unlike behavioral approach where the focus is on the environment. The 'constructivist approach' to understanding learning represents a close approximation to a pure cognitive approach. It is based on the premise that the student is a naturally active learner who constructs new personalized knowledge through linking prior knowledge. The instructional model that best articulates the basic principles of a constructivist approach to teaching is called reciprocal teaching. According to Palincsar and Brown (1984, 1986), the reciprocal teaching approach is characterized by the following dimensions

- Instruction is viewed as a dialogue between the teacher and the students.
- Instruction is characterized by a high degree of ongoing interaction between the teacher and the students and among the students.
- Instruction is scaffolded; that is, the teacher begins instruction in a strategy at the point where instruction is required to support the students in the next step to complete a task and then fades the support so that the students are challenged to use the strategy.
- Teacher judgment and timing are critical in the process of successfully guiding the students to reflect on their performance and learning.
- The skill level of the students should not affect participation.
- The purpose of teaching strategies is to answer questions, and the goal of instruction is not to learn to use strategies.

Integration of paradigms: According to Mather and Roberts (1994) "We believe that no one intervention or approach can address the complex nature of school success or failure for the students at risk and those challenged by disabilities, we believe that a purposeful, integrated approach to teaching and learning that directly addresses transactional relationships among affective, behavioral, cognitive, developmental, ecological and social processes of change and outcomes is particularly appropriate and important."

Effective teaching practices:

- Planning activities: It includes an array of tasks that range from engaging in critical thinking to arranging schedules. Various planning activities are as follows:
  - ➢ Develop empowering beliefs about teaching: To maximize student outcomes, teachers should individualize instruction (students should receive daily instruction tailored to their educational needs), base instructional practices on scientific research (an educator must maintain an empirical orientation to teaching practices), and maintain proactive expectancies of learners (teachers must enter the instructional arena with an

appreciation of each students' uniqueness and a willingness to examine and use a variety or resources).

- Consider instructional variables related to student learning:
  - ➢ Focus on time for learning: 'Engaged time' is the time a student actually spends performing an academic task. The time allocated to a content area is associated positively with learning in that area, and the engaged time that students spend successfully performing reading or mathematics tasks is associated positively with learning.
  - ➢ Ensure high rates of student success: Success refers to the rate at which the student understands and correctly completes exercises. Success is defined according to the difficulty level of the materials. In high success, the student understands the task and makes occasional careless errors. With moderate success, the student partially understands the material and makes numerous mistakes and in low success, the student does not comprehend the material. Instruction that promotes high success not only contributes to improved achievement, but also fosters increased levels of self-esteem and positive attitude towards academic learning and school. The teacher must match the learning task to the student's aptitude to develop an instructional program that ensures student success.
  - ➢ Provide positive and supportive learning environments: Teacher expectations, encouragements, evaluations, attentiveness and attitudes greatly influence student's perceptions of themselves as learners. Sprick (1985) notes that learning is greater and behavior is more appropriate in classrooms in which teachers attend to more positive events than to negative events. The teacher may consider the following questions to examine his or her potential influence on creating a positive and supportive learning environment: Am I enthusiastic most of the time? What is my attitude toward students/ towards peers? Do I support all students? Do I admit mistakes and remain comfortable? Do I change my opinion with new information? Am I happy? Do I laugh and smile much? Is my job fulfilling? Do I take care of my physical and emotional health? Am I a good listener?
  - ➢ Strive to motivate: The initial step in preventing classroom behavior problems is keeping students motivated and thus, engaged in the learning process. 'Motivation' is used to describe what focuses or energizes a student's attention, emotions and activity. Motivators can be internal or external and they respond to things or events that influence choices. Internal motivation (desire to do something) comes from within the individual and external motivation (e.g. parental pressure to do homework) comes from within the environment. Due to frustration, students with learning disabilities may lose their motivation. Thus the teacher should plan systematic procedures to increase motivation. Setting realistic instructional goals and determining specific mastery criteria are important to student motivation. Clifford states "it is only success

at moderately difficult tasks that we explain in terms of personal effort, well chosen strategies and ability; and these explanations give rise to feelings of pride, competence, satisfaction, persistence, and personal control."

- Consider the curriculum: A curriculum is what is taught in school and consists of learning outcomes. It is established before students enter the school, and it represents what society values as important for becoming a productive citizen and successful individual. To accommodate some students with learning disabilities, it is necessary to prioritize the content to ensure that the most important content is mastered. It refers to covering highly valued content extensively so that students achieve understanding and mastery of this important content. Students with learning disabilities learn better when instruction follows research supported interactive teaching activities e.g. explicit modeling, corrective feedback and monitoring of progress.
- Consider instructional arrangements: these basic instructional arrangements are available to teachers:
  a) Large group instruction: Teacher presentation to a large group (more than 8 students) can be an effective method of instruction. It is time efficient and it prepares students for the type of instruction that primarily is used in secondary schools, community colleges, and universities. Its disadvantage is that it does not allow for the teacher to deal easily with diversity in ability levels that is present in most classrooms.
  b) Small group instruction: It consists of 3 to 7 students and represents a major format for teaching academic skills. It is recommended specially for students with learning disabilities. During small group instruction, students are more likely to monitor their own progress, ask for help, and follow directions than in large group settings.
  c) One student with teacher: One to one tutoring is a powerful instructional arrangement and is often named by teachers as being the ideal supplementary teaching model. Interventions that employ one to one tutoring result in improvements in student cognitive achievement, attitudes, and self concept as compared with group methods of instruction. When teachers observe students having difficulty during group instruction or seatwork, they can give them attention at the first opportunity which helps a student understand a concept, receive corrective feedback, understand directions and feel motivated to continue working.
  d) Students teaching students: Most peer instructional arrangements feature either peer tutoring or cooperative learning. 'Peer tutoring' is an instructional arrangement in which the teacher pairs two students in a tutor-tutee relationship to promote learning of academic skills or subject content. The teacher determines the academic task and provides the instructional materials. According to studies, in peer tutoring programs, tutor and tutee benefits in academics are reported for students with and without learning disabilities. 'Cooperative learning' represents another instructional arrangement in which peers work independently. This format provides students with an opportunity to practice

skills or learn content presented by the teacher and supplements teacher instruction. Cooperative learning emphasizes team goals and team success is achieved only if each individual learns. It is designed to promote the student's responsibility for their own learning and the learning of others.

e) Students working independently: The students working independently arrangement provides these students with opportunities to practice skills that the teacher has presented. Some guidelines to promote effective independent seatwork program are as follows:

   I.   Ensure that the independent work assignments are tailored to the students instructional levels.

   II.   Use a variety of independent seatwork activities e.g. instructional games, computer assisted instruction, audio-taped instruction etc. provides the teacher with alternatives and tends to increase student motivation and time on task.

   III.   Prepare meaningful activities to accommodate students finishing their work at different times.

   IV.   Design procedures that enable students to ask questions while doing independent seatwork.

   V.   Ensure that students understand the instructions for their seatwork activities before starting small-group instruction.

   VI.   Use the direct instruction teaching sequence to teach the behavioral expectations for independent seatwork.

Self correcting materials provide the student with immediate feedback without the teacher being present. When the student makes a mistake with a self correcting material, it is a private event – it happens without anyone else knowing it. Only the student sees the error, and the error can be corrected immediately. Furthermore, if immediate feedback is not provided, mistakes will be practiced until the teacher corrects the student at a later time. With self correcting materials the student is corrected immediately and practices only the correct response. There are many ways to make self correcting materials which includes the use of answer keys, matching cards, puzzles, pocket calculators, and computers. The materials should be simple in design so that one demonstration enables students to operate them.

- Consider learner variables: To provide an appropriate education to students with learning disabilities, it is essential to develop an IEP for each that features an instructional match. To accomplish an instructional match, the teacher must assess the strengths, weaknesses and needs of a student and design an instructional program based on these assessment results.

Interactive teaching activities:

a) Focus on teaching competencies: Teaching styles are developed individually but they should not be based on whims, biases or personal opinions. Teachers and educators have

a responsibility to examine the research and apply the findings as they develop teacher practices. Greenwood, Arreaga-Mayer and Carta (1994) found that students in classrooms in which teachers used research based interactive teaching practices had higher academic engagement times and higher achievement scores than did students in classrooms in which teachers used other methods.

b) Follow a lesson planning format: The following lesson plan guideline was developed by Mercer, Jordan and Miller (1994) and incorporates much of the effective teaching research.

➢ Step 1: Give an advance organizer – the teacher links the lesson to previous learning or lessons; the teacher identifies the target skill; the teacher provides a rationale for learning the skill or strategy and discusses the relevance of the new knowledge.

➢ Step 2: Describe and model the skill or strategy – At first the teacher asks a question and provides the answer. Later, the teacher asks a question and the student helps provide the answer. The teacher and student perform the strategy together, and the teacher continues to provide modeling.

➢ Step 3: Conduct guided practice and interactive discourse

➢ Step 4: Conduct independent practice to mastery

➢ Step 5: Provide elaborated feedback.

➢ Step 6: Teach generalization and transfer – the teacher encourages the student to reflect on applications of new knowledge across settings and situations.

Postinstructional activities: It is assumed that these following post instructional activities improves teaching effectiveness:

1) Reflecting on one's actions and student's responses.
2) Staying current on subject matter and educational issues by reading journals, texts or professional organizational literature
3) Taking advanced educational courses
4) Interacting with colleagues to coordinate teaching plans.

One of the primary activities of postinstruction involves the process of reflecting about teaching. According to Brandt (1991) "Everyone needs opportunities for self renewal, but those responsible for developing other human beings need them most of all. Thinking deeply about what we are doing leads us to ask better questions, break out of fruitless routines, make unexpected connections and experiment with fresh ideas."