Teaching and Learning Theories
Module 5

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THE TOP TEN REQUIREMENTS

by Richard Leblane, York University Ontario

This article appeared in The Teaching Professor after Professor Leblane won a Seymour Schulich Award for Teaching Excellence including a $10,000 cash award.
Objectives of this Module

By the end of this module participants will be able to:

- Describe the main concepts in learning theories associated with the behaviorist, cognitivist, and constructivist approaches
- Relate learning theories and learning styles to specific teaching methods and/or strategies
Summary of theories

- **Behaviorism** – observable changes in behavior until it becomes automatic

- **Cognitivism** – thought process behind the behavior

- **Constructivism** – we construct our own perspective of the world based on our experiences
Rationale of behaviorism theory

- How learning occurs?
- The S-R theory
- Experimental proof as shown by animal behaviour
- The role of reward, repetition, familiarity, motivation
Basics of Behaviorism

- study of overt behavior observed and measured over time
- Only behavior that can be observed could be studied
- views the mind as a ‘black box’ ignoring the thought processes
Basics of Behaviorism (con’t)

- research on animals

- believed that complex patterns could be taught and shaped by proper conditioning

- Placed instruction rather than the learner at centre stage

- influenced formal education

  acquisition of concepts → classroom practice → TEST
Pavlov’s Classical Conditioning or Stimulus Substitution

- Before conditioning, ringing the bell → no response from the dog
- During conditioning, the bell rung and food served
- After conditioning, the ringing of the bell alone → salivation
## Stimulus & Response (Pavlov)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>Unconditioned Stimulus</td>
</tr>
<tr>
<td>Salivation</td>
<td>Unconditioned Response (natural, not learned)</td>
</tr>
<tr>
<td>Bell</td>
<td>Conditioned Stimulus</td>
</tr>
<tr>
<td>Salivation</td>
<td>Conditioned Response (to bell)</td>
</tr>
</tbody>
</table>
How to teach a pigeon to play table tennis in five easy lessons?

- First, stand your pigeon behind a ping pong ball. Whenever it approaches the ball, (by chance at first) give it some food. Soon your pigeon will have conditioned to approach the ball.
- Now only give the pigeon food when it actually touches the ball.
- When the pigeon has learned to touch the ball, start to reward it only when it pushes the ball forward.
- Continue training in the same way until the pigeon can knock the ball over a net.
- Your pigeon is now ready to confront an opponent (another pigeon). You now only reward when they push the ball their opponent. The championship can commence.
Thorndike’s theory, Connection between stimulus (S) and response (R)

- ‘Law of effect’: connection between S and R
- ‘Law of exercise’: practice makes perfect
- ‘Law of readiness’: differs between people
Skinner’s Operant Conditioning

- Positive Reinforcement

Responses that are rewarded are likely to be repeated (e.g. good grades)
Implications to Learner

- **Cue/Stimulus** → **Behavior/Response**
  
  Consequence/Reinforcement
Implications to teaching?

Your response, please...
Basics of Cognitivism

- the learner, not the instruction as centre stage

- students bring a unique set of prior experiences, prior knowledge and genetically endowed abilities.

Students differ:
- responding to learning activities
- transferring knowledge or skills
Concepts in Cognitive Theory

- **Schema** - internal knowledge structure

- **3 Stage Information Processing Model** - sensory register, short-term memory, long-term memory.
Implications to the Teacher

- Focus on learner’s thought process.

- manipulates the learner’s thought process → follow a mental model
Implications to the teaching and learning process?

Your response, please....
Constructivism

In this theory ‘learners construct their own reality or at least interpret it based upon their perceptions of experiences, …… an individual’s knowledge is a function of one’s prior experiences, mental structures, and beliefs that are used to interpret objects and events’. (Jonasson, 1991)
Assumptions of Constructivism

- Knowledge is constructed from experience
- Learning is a personal interpretation of the world
- Processes in the mind are constantly in a state of flux
Constructivists approach to learning

- subjective construction of meaning from experience by those involved in a specific context
- ‘zone of proximal development’
- knowledge and understanding deepened through ‘authentic’ tasks in ‘realistic’ setting.
- imitation, cooperation and communication \(\rightarrow\) ‘cognitive apprentices’ to expert practitioners
Constructivists approach to learning (con’t)

- **Promotes deep approach to learning**
  - understand material
  - interact vigorously and critically with content
  - relate ideas to previous knowledge
  - use organizing principles to integrate ideas
  - relates evidence to conclusion
  - examine logic to argument
Implications to the Teacher

- Instruction promotes the mental construction of the learner’s reality.
- The instructor facilitates the learner’s conceptual modeling by helping him think in different ways.
- Learners develop different realities.
Summary

- **Behaviorism**: Based on behavioral changes

- **Cognitivism**: Based on the thought process behind the behavior

- **Constructivism**: Based on the premise that we all construct our own perspectives of the world, based on individual experiences and schema.
Reflection

- What are your thoughts on the 3 main learning theories?
- How does it impact the teaching and learning process at undergraduate level?
Learning Styles

Knowing the learning style will help the student capitalize on the strengths and compensate for any weaknesses.
Learning Styles

- Try the Learning Styles Questionnaire
  (Refer Handout)
Experiential Learning Circle - David Kolb (1984)

Concrete experience
Activists

Testing in new situations
Pragmatists

Observation & reflection
Reflectors

Forming abstract concepts
Theorists
Learning Styles – General Descriptions

- Activists
  - Activity driven, try everything once
- Reflectors
  - Observe & think, tolerant, thinkers
- Theorists
  - Analyze, synthesize, logical, objective
- Pragmatists
  - Practical, try out new ideas
Learning Styles

- **Visual Learners**
  - Teacher’s body language/facial expression
  - Sit in front of the class
  - Visual displays e.g. transparencies, diagrams, videos, flipcharts, handouts

- **Auditory Learners**
  - Verbal lectures, discussions, tone of voice, pitch, reading text aloud, using tape recorder

- **Tactile/Kinesthetic Learners**
  - Hands-on approach, activity-oriented
Kolb’s experiential learning theory

Individual learning style is shaped by natural learning experiences that occur through maturation.

“As a result of our hereditary equipment, or particular past experiences and the demands of our present environment, people develop learning styles that emphasize some learning abilities over others.” (Kolb, 1975)
Kolb’s experiential learning theory (2)

- As the individual develops he learns by all these phases, but is likely to develop a preference for learning more by one method than another, and thus a preferred style is developed.
Kolb’s experiential learning theory (3)

- Learning styles are **unlikely** to be permanently fixed but will alter in relation to motivation and circumstances.

- **Each discipline** attracts individuals with a learning style **congruent** with its **structure of knowledge** and also that learning style is further accentuated through education and experience in the discipline learning.
Kolb’s experiential learning theory (4)

- Students have the potential to alter their learning styles in order to enable them to benefit from the learning experiences which are offered.

- Different learning strategies suit different learning styles and students may require more help where the strategy does not suit their learning style.

- Awareness of individual learning style will enable the selection of appropriate learning strategies.
Multiple Intelligence theory

It is of the utmost importance that we recognize and nurture all of the varied human intelligences, and all of the combinations of intelligences. We are all so different, largely because we all have different combinations of intelligences. If we recognize this, I think we will have at least a better chance of dealing appropriately with the many problems that we face in the world (Gardner, 1987)
Types of Multiple Intelligence

- Visual/Spatial Intelligence
- Verbal/Linguistic Intelligence
- Logical/Mathematical Intelligence
- Bodily/Kinesthetetic Intelligence
- Musical/Rhythmic Intelligence
- Interpersonal Intelligence
- Intrapersonal Intelligence
- Naturalist intelligence
8 Styles of Learning Based on Multiple Intelligence

- Linguistic learner
- Logical/Mathematical learner
- Spatial learner
- Musical learner
- Bodily/Kinesthetic learner
- Naturalistic learner
- Interpersonal learner
- Intrapersonal learner
Group discussion

- What are your reactions to Gardner’s list of seven intelligence?
  Spend a moment in reflection...then responses please...
Key points for more effective learning

- **Personality** can be a major factor in encouraging/discouraging learning
- The **motivation** of the learner is an important feature in learning
- The interest of the **teacher** helps to engage learners
- **Relevance of material**
- Learning encompasses more than vocal delivery
- The importance of using and responding to **feedback**
- **Activity** potentially helps to engage participants with the material
Motivating students - 8 simple rules for instructors – Lana Becker and Kent N. Schneider, East Tennessee State University

1. Emphasize the most **critical concepts** continuously.
2. Provide students with a ‘**visual aid**’ when explaining abstract concepts.
3. Rely on **logical thinking** when applicable.
4. Use **in-class activities** to reinforce newly presented material.
5. Help students **create a “link”** when teaching something new.
6. Recognize the importance of **vocabulary** in a course.
7. Treat students with **respect**.
8. Hold students to a **high standard**.
Group discussion

On a final note,

- What is real learning?

- How do you know that real learning has taken place?
Quotations linked to the topic of learning

- When a pupil is ready, the Master will come. (a Chinese saying)
- Those who teach shall also learn and those who learn shall teach (Peter Laslett)
- You cannot teach a man anything. You can only help him find it within himself. (Galileo)
Thank you & Good Luck