COS750:
A brief introduction to Educational Theories

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Discussion

• What is a theory?
  – Generalized explanation of some phenomena.
  – Can be used to explain things.

• How do you learn? (Can you come up with a theory?)
  – Learning not to bite or kick people that frustrate you.
  – Learning to be polite to others.
  – Learning to type on a keyboard.
  – Learning to play a musical instrument.
  – Learning to ride a bicycle.
  – Learning to do long division.
  – Learning to speak a new language.
  – Learning to program.
Behaviourism – classical conditioning

• Ivan Pavlov (1849 – 1936)
  – Russian psychologist
  – Classical conditioning: Pavlov’s dogs

• John B. Watson (1878 – 1958)
  – American psychologist who established the psychological school of behaviorism.
  – Watson denied the existence of the mind (different behaviours were due to different experiences of learning).
  – Conducted research on animal behaviour, child rearing & advertising.
  – Controversial “Little Albert” experiment.

• Classical conditioning and learning:
  – Ensure that learners associate positive emotional experiences with learning.
  – Make sure you don’t create a phobia!
Behaviourism – operant conditioning

• **B.F. Skinner (1904 – 1990)**
  – Principle of reinforcement: he believed that human action is the result of consequences of the same action.
  – If the consequences are good, the action will probably be repeated, but if the consequences are bad, there is a high chance that the action will not be repeated.
  – Skinner box (to study operant conditioning in animals)
  – Skinner’s teaching machine (to address delayed reinforcement in classrooms)

• **Operant conditioning and learning:**
  – Use feedback and rewards to shape behaviour.
  – Positive reinforcement (positive consequences from doing something good)
  – Negative reinforcement (avoid negative consequences by doing something good)
  – Avoid punishment (weakens behaviour)
  – Very relevant for developing skills.
Cognitivism emerged in the 1950s due to the dissatisfaction with behaviourism (and the focus on external behaviour, rather than internal processes).

Cognitive psychologists study things like perception, attention, language, memory, thinking.

The human brain as a processor of information (like a computer).

Examples of cognitivism in learning: traditional lecturing, reading textbooks, absorbing knowledge.

Video ... The Cognitive Revolution.
Constructivism

- Emerged in the 1970s and 1980s.
- Idea: learners are not just passive recipients of information, but they actively construct new knowledge through interaction with the environment and constant re-building of internal models.
- From knowledge acquisition to knowledge construction.
- The view of the learner changes from a processor of information, into actively involved with sense-making.
- View of the teacher changes from transmitter of knowledge to cognitive guide.
- Jean Piaget (1896 – 1980)
  - Swiss psychologist.
  - Proposed a model of cognitive development in children with different stages.
- Video: Piaget’s Developmental Theory and Overview
Constructivism

• By reflecting on our own experiences, we construct our own understanding of something.
• We all have our own internal models for making sense of things.
• Learning = adjusting our internal models of understanding to incorporate something new.
• Learning is a search for meaning.
• Focus is on concepts, rather than isolated facts.
• Instructors using constructivism:
  – Make connections between facts.
  – Help students to see the bigger picture, overall meaning.
  – Encourage analysis, interpretation, dialogue using open-ended questions.
Social Learning Theory

• Albert Bandura (born 1925):
  – Canadian psychologist.
  – Behaviour is learnt from the environment through observing.
  – Adds a social context to behaviourism and cognitivism.
  – Children learn from observing others and from “model” behaviour.
  – Models are any individuals that are observed (in real life, TV, games, etc.)
  – Children pay attention and encode the observed behaviour, which is copied later on.
  – Copying is more likely if the child identifies with the model.
  – Reinforcement (positive or negative) will determine whether the behaviour will continue or not.
  – Behaviour can also be influenced by what happens to the model (vicarious/indirect reinforcement).

• Instructors using social learning theory:
  – Learners observe experts in action.
  – Learners should relate to models.
SKINNER
TO
ENTER,
PRESS
LEVER

PAVLOV
KNOCK,
DO NOT
RING BELL.
DOGS
INSIDE

BANDURA
PLEASE WATCH
VIDEOTAPE
ON HOW
TO KNOCK
Social constructivism

• Lev Vygotsky (1896 - 1934)
  – Soviet psychologist.
  – Stressed the role of social interaction (language and culture) in cognitive development.
  – Social learning comes before cognitive development.
  – What can learners achieve in a social context as opposed to learning on their own?

• Instructors using social constructivism
  – Collaborative and cooperative learning.
  – Individual learning can be enhanced by successful group learning.
Discussion

• Educational theories that we introduced:
  – Behavioural (classical and operant conditioning).
  – Cognitivism
  – Constructivism
  – Social learning theory
  – Social constructivism

• Which is more predominant in current educational practices?

• Can you think of appropriate ways of applying the different theories in educational software development?
I taught stripe how to whistle.

I don't hear him whistling.

I said I taught him. I didn't say he learned it.