

Instructional Strategies Grounded in Theory & Research

Constructivist Learning Environments

(Honebein, 1996)

Based on constructivist theories of human learning, Honebein presents seven goals for constructivist learning environments

1. **Knowledge Construction:** Provide experience with knowledge construction process
2. **Multiple Perspectives:** Provide experience in and appreciation for multiple perspectives
3. **Authentic:** Embed learning in realistic and relevant context
4. **Voice:** Encourage ownership and voice in learning process
5. **Social:** Embed learning in social experience
6. **Multimedia:** Encourage use of multiple modes of representation
7. **Reflection:** Encourage self-awareness of knowledge construction process

Problem-Based Learning

(Barrows, 1985)

Disenchanted with medical students' ability to apply information learned from lectures, Barrow's developed this model for instruction which focuses on the problem-solving process.

1. **Start New Class**
 - 1.1 Introductions
 - 1.2 Climate Setting (including teacher/tutor role)
2. **Start New Problem**
 - 2.1 Set problem
 - 2.2 Bring problem home
 - 2.3 Describe the product/performance required
 - 2.4 Assign tasks
 - 2.5 Reason through the problem (i.e., ideas/hypotheses, facts, learning issues and action plan).
 - 2.6 Commitment as to probable outcome
 - 2.7 Learning issues shaping/assignment
 - 2.8 Resource identification
 - 2.9 Schedule follow-up
3. **Problem Follow-Up**
 - 3.1 Resources used and their critique
 - 3.2 Reassess the problem (i.e., ideas/hypotheses, facts, learning issues and action plan).
4. **Performance Presentation(s)**
5. **After Conclusion of Problem**
 - 5.1 Knowledge abstraction and summary
 - 5.2 Self-evaluation

Simulation Model

(Joyce, Weil, & Showers, 1992)

Based on the application of cybernetic principles to education, the purpose of this model is to help students develop skills and knowledge by examining the consequences of their actions.

1. Orientation

- 1.1 Present broad topic of simulation and major concepts
- 1.2 Explain simulation and gaming
- 1.3 Give overview of the simulation

2. Participant Training

- 2.1 Set-up scenario (rules, roles, procedures, scoring, types of decisions, goals)
- 2.2 Assign roles
- 2.3 Hold abbreviated practice session

3. Simulation Operations

- 3.1 Conduct game activity and game administration
- 3.2 Feedback and evaluation (of performance and effects of decisions)
- 3.3 Clarify misconceptions
- 3.4 Continue simulation

4. Participant Debriefing

- 4.1 Summarize events and perceptions
- 4.2 Summarize difficulties and insights
- 4.3 Analyze process
- 4.4 Compare simulation activity to the real world
- 4.5 Appraise and redesign the simulation

Experiential Learning Model

(Pfeiffer & Jones, 1975)

Based on the belief that people learn best by doing, the experiential learning model can start with didactic (passive) forms of instruction but soon progresses to experiential (active) forms of learning.

1. **Experience** – Immerse learner in “authentic” experience (e.g., real or simulated job task). Learners generate individual information using applicable senses.
2. **Publish** – Talking or writing about experience. Sharing observations, thoughts, and feelings.
3. **Process** – Debrief: Interpret published information, defining patterns, discrepancies and overall dynamics, making sense of the information generated by group.
4. **Internalize** – Private process, learner reflects on lessons learned, means of managing conflicting data and requirements for future learning.
5. **Generalize** – Develop hypotheses, form generalizations and reach conclusions from information and knowledge gained from lesson.
6. **Apply** – Use information and knowledge gained from lesson to make decisions and solve problems. Put learned skills and knowledge into action.

Inquiry Training Model

(Joyce, Weil, & Showers, 1992)

This model is designed to promote strategies of inquiry and the values and attitudes that are essential to an inquiring mind including: process skills (e.g., observing, collecting and organizing data), active learning, verbal expression, tolerance of ambiguity, and logical thinking.

1. **Confrontation** with the Problem
 - 1.1 Explain inquiry procedures
 - 1.2 Present discrepant event
2. **Data Gathering** - Verification
 - 2.1 Verify nature of objects and conditions
 - 2.2 Verify the occurrence of the problem situation
3. **Data Gathering** - Experimentation
 - 3.1 Isolate relevant variables
 - 3.2 Hypothesize (and test) casual relationships
4. **Organizing, Formulating and Explanation** - Formulate rules or explanations
5. **Analysis** of inquiry process - Analyze inquiry strategy and develop more effective ones.

WebQuest

(Dodge, 1998)

WebQuest is an inquiry-oriented strategy in which most or all of the information used by learners is drawn from the Web. They focus learners' time and attention on using rather than looking for information. They are also designed to support learners' effort to analyze, synthesize and evaluate.

1. **The Introduction** orients students and captures their interest
2. **The Task** describes the activity's end product
3. **The Process** explains strategies students should use to complete the task
4. **The Resources** are the Web sites students use to complete the task
5. **The Evaluation** measures the results of the activity
6. **The Conclusion** sums up the activity and encourages students to reflect on its process and results

Jurisprudential Inquiry Approach

(Oliver & Shaver, 1971)

Based on Socratic modes of discussion, the purpose of this model is to help students resolve complex, controversial issues within the context of a productive social order:

1. **Orientation** to the Case
2. **Identifying** the Issues
3. **Taking Positions**
4. **Exploring the Stance(s)**, patterns of argumentation
5. **Refining and Qualifying** the positions
6. **Testing Factual Assumptions** behind qualified positions

Inductive-Thinking Model

(Taba, 1967)

Based on information-processing theories of human learning, the inductive-thinking model was developed to enhance students' acquisition of concepts, information processing skills as well as their convergent use of information to solve problems.

1. **Concept Formation**
 - 1.1 Enumeration and listing
 - 1.2 Grouping
 - 1.3 Labeling, Categorizing
2. **Interpretation of Data**
 - 2.1 Identify critical relationships
 - 2.2 Explore relationships
 - 2.3 Make inferences
3. **Application of Principles**
 - 3.1 Predicting consequences, explaining unfamiliar phenomena, hypothesizing
 - 3.2 Explaining and/or supporting the predictions and hypotheses
 - 3.3 Verifying predictions

Elaboration Theory of Instruction

(Reigeluth, 1987, 1983)

This model for instruction was developed by Charles Reigeluth and associates in the 1970s. One analogy used to describe this model is the use of a zoom lens on a camera. If a picture is presented using the wide-angle lens and then the zoom lens is used to get a detailed look at a particular part of the picture then according to this model you must zoom back out to gain an understanding as to how this part is related to the entire picture. This process would be used to look at various parts of the picture based on learner control or system (teacher) control (Reigeluth and Rodgers, 1980; Wilson and Cole, 1992).

1. **Organizing structure**: May be one of three types:
 - 1.1 Conceptual: easiest concepts first
 - 1.2 Procedural: present steps in order of their performance
 - 1.3 Theoretical: simple to complex
2. **Simple-to-complex sequence**: Instruction begins in a fundamental and concrete way with an *epitome* lesson. Successive lessons add layers of complexity.
3. **Within-lesson sequencing**:
 - 3.1 Conceptual: easiest concepts first
 - 3.2 Procedures: present steps in order of their performance
 - 3.3 Theoretical: simple to complex
4. **Summarizers**: Content reviews at lesson and unit levels
5. **Synthesizers**: Presentation devices to enable learners to integrate content elements into meaningful whole.
6. **Analogies**: Relate content to learners' prior knowledge.
7. **Cognitive strategy activators**: cues used for cognitive strategy use either *embedded* or *detached*.
8. **Learner control**: Learners are encouraged to take control over their learning.

Nine Events of Instruction

(Gagne, 1974, 1977; Gagne & Medsker, 1996)

Based on information processing theories and models of human learning, Gagne posits that every unit of instruction should contain the following nine events to facilitate student learning:

1. **Gain** Attention
2. **Inform** Learners of Objective(s)
3. **Stimulate** Recall of Prior Knowledge
4. **Present** Stimulus Materials
5. **Provide** Learning Guidance
6. **Elicit** Performance
7. **Provide** Feedback about Performance
8. **Assess** Performance
9. **Enhance** Retention and Transfer

Eight Events for Student Centered Learning

(Hirumi, 1998, 1996)

Based on constructivist theories of human learning, Hirumi presents seven instructional events that occur during a course to help students construct their own meaning based on their own interests and prior knowledge structures, and to promote independent, life-long learning:

1. **Set Learning Challenge** (Authentic Problem) for Class
2. **Negotiate Learning Goals and Objectives**
3. **Negotiate Learning Strategy**
4. **Construct Knowledge**
5. **Negotiate Performance Criteria**
6. **Assess Learning** (Self, Peer & Expert Assessment)
7. **Provide Feedback** (Throughout Steps 1-6)
8. **Communicate Results**

4Mat System Model

(McCarthy, 1987)

Based on research and literature on learning styles, this eight-step cycle of instruction is meant to capitalize on students' learning styles and brain dominance processing strengths. Rather than focus on one learning style, this method encourages students to examine and experience all learning styles.

1. **Create** an experience
2. **Reflect/Analyze** Experience
3. **Integrate** reflective analysis into concepts
4. **Develop** concepts/skills
5. **Practice** defined "givens"
6. **Practice** adding something of oneself
7. **Analyze** application for relevance, usefulness
8. **Apply** to new more complex experience

Elements of Lesson Design (Hunter, 1990)

Widely known model for preparing lesson plans taught to pre-service teachers. Often used to evaluate lesson plans prepared by practicing educators.

1. **Anticipatory Set** – How will students' attention be focused?
2. **Objective and Purpose** – What will students learn and why?
3. **Input** – What new information will be discussed?
4. **Modeling** – How can teacher illustrate new skill or content?
5. **Check for Understanding** – How can teacher determine if students are learning?
6. **Guided Practice** – What opportunities are given to practice new materials?
7. **Independent Practice** – How can assignments be used for retention and transfer?

Direct Instruction Model (Joyce, Weil, & Showers, 1992)

Based on behaviorist theories of human learning, this model is designed to facilitate learning through stimulus-response conditioning and is said to generate and sustain motivation through pacing and reinforcement.

1. **Orientation**
 - 1.1 Establish lesson content
 - 1.2 Review previous learning
 - 1.3 Establish lesson objectives
 - 1.4 Establish lesson procedures
2. **Presentation**
 - 2.1 Explain/demonstrate new concept or skill
 - 2.2 Provide visual representation of task
 - 2.3 Check for understanding
3. **Structured Practice**
 - 3.1 Lead group through practice example in lock step
 - 3.2 Students respond to questions
 - 3.3 Provide corrective feedback for errors and reinforce correct practice
4. **Guided Practice**
 - 4.1 Students practice semi-independently
 - 4.2 Circulate, monitor student practice
 - 4.3 Provide feedback through praise, prompt, and leave
5. **Independent Practice**
 - 5.1 Students practice independently at home or in class
 - 5.2 Provide delayed feedback

SQR Model
(Maier, 1996)

This strategy is designed to encourage students' to take responsibility for their learning and to give students a way to generate their own ideas. In general, this strategy is geared toward enhancing student learning from reading, but may be applied in other context.

1. **Summarize**
 - 1.1 Read materials
 - 1.2 Write a summary of the materials in journal
2. **Question**
 - 2.1 Write question on the materials in journal
 - 2.2 Discuss summaries and questions in small group
 - 2.3 Select "best" question to share with whole class based on ability to provoke engaging discussions
 - 2.4 Discuss "best" questions with whole class utilizing questioning techniques
3. **Response** - Write a response to the small group or whole group class discussion (summary of main points)

SQ3R Study Strategy
(Robinson, 1961)

This strategy is designed to help students develop their study skills, particularly in relation to reading assignments.

1. **Survey** - Readers preview materials to develop general outline for organizing information.
2. **Question** - Reader raises questions with expectation of finding answers in materials
3. **Read** - Reader attempts to answer questions by reading
4. **Recite** - Reader answers questions out loud or in writing
5. **Review** - Reader rereads portions of materials to verify answers given during previous step

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