

Direct and Indirect Instruction

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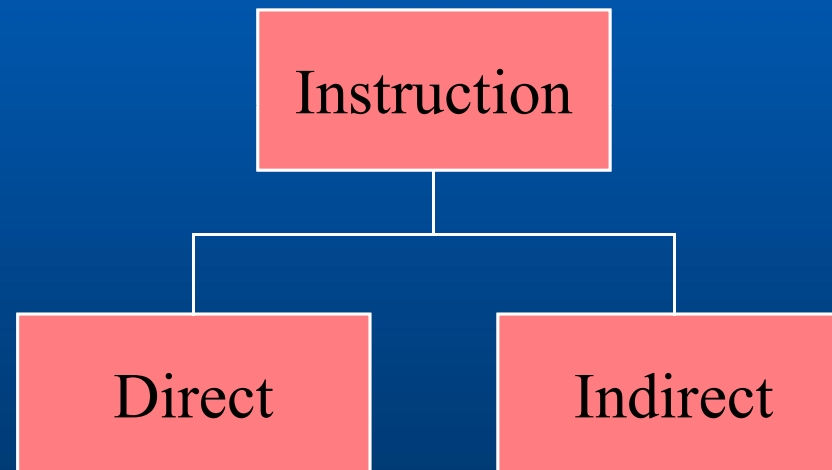
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Direct Instruction: What Is It?





Direct Instruction Model

- **Review** of previously-learned material
- **State** the objectives
- **Present** new material
- **Guided** practice
- Independent **practice**
- Periodic **review** with “corrective feedback”



Attributes of DI -- Common Term

- **Direct Instruction**
 - *Tutorial*
- **Indirect Instruction**
 - *Experiential*



Attributes of DI -- Philosophy

- **Direct Instruction**
 - *Instructivist* by nature
- **Indirect Instruction**
 - *Constructivist* by Nature



Attributes of DI -- Messaging

- **Direct Instruction**
 - *Direct Messaging*
- **Indirect Instruction**
 - *Indirect Messaging*



Attributes of DI -- Learner Role

- **Direct Instruction**

- Learner is *passive* receptor

- **Indirect Instruction**

- Learner is *active* receptor



Attributes of DI -- “Directedness”

- **Direct Instruction**
 - Instruction is *Direct*
- **Indirect Instruction**
 - Instruction is *Indirect*



Attributes of DI -- Environment

- **Direct Instruction**

- Instructional environment -- *minimized*

- **Indirect Instruction**

- Instructional environment -- *vital*



Attributes of DI -- Environment

- **Direct Instruction**

- Instructional environment -- *not acted upon*

- **Indirect Instruction**

- Instructional environment -- *acted upon*



Attributes of DI -- Environment

- **Direct Instruction**

- Instructional environment -- *not important*

- **Indirect Instruction**

- Instructional environment -- *important*



Attributes of DI -- Content

- **Direct Instruction**
 - *“Focussed”* content
- **Indirect Instruction**
 - *“Unfocussed”* content



Attributes of DI -- Student Given...

- **Direct Instruction**
 - *all of the pieces*
- **Indirect Instruction**
 - *some of the pieces*



Attributes of DI -- Structure

- **Direct Instruction**

- *instruction “structures” the pieces*

- **Indirect Instruction**

- *learner “structures” the pieces*



Attributes of DI -- Reasoning Types

- **Direct Instruction**

- allows for both *inductive* (top down) and *deductive* (bottom up) training

- **Indirect Instruction**

- allows for *problem solving*



Attributes of DI -- “Understanding”

- **Direct Instruction**

- understanding is based on someone else’s structure

- **Indirect Instruction**

- learners must generate own “structure of understanding”



Attributes of DI -- “Schema”

- **Direct Instruction**

- final “schema” is *preset*

- **Indirect Instruction**

- final “schema” is *developed by learner*



Attributes of DI -- Samples...

- **Direct Instruction**

- *Examples* are appropriate; more the better...

- **Indirect Instruction**

- *Simulations* are appropriate; environments in which learner must solve problems



Attributes of DI -- Type of Probes

- **Direct Instruction**

- *Assessed by simple questions; closed-ended*

- **Indirect Instruction**

- *Assessed by sets of problems to be solved*



Who Benefits from DI?

- **Does**
 - Kids who are slower...
 - Kids who need structure -- *at first*
 - Kids who are being taught:
 - procedures
 - facts
 - concepts -- concrete to abstract
 - **Instructional Software Developers**

Hunter's Clinical Theory of Instruction



- Step 1: Anticipatory Set:
- Step 2: The Objectives and Its Purpose
- Step 3: Instructional Input
- Step 4: Modeling
- Step 5: Checking for Understanding
- Step 6: Guided Practice
- Step 7: Independent Practice

Instructional Functions-1



- **Daily Review and Checking Homework**
- **Presentation**
 - **Provide short statement of objectives**
 - **Provide overview and structuring**
 - **Proceed in small steps but at a rapid pace**
 - **Intersperse questions within the demonstration to check for understanding**
 - **Highlight main points**
 - **Provide sufficient illustrations and concrete examples**
 - **Provide demonstrations and models**
 - **Give detailed instructions and examples when necessary**



● Guided Practice

- continues until ~ 80 % success rate
- all students have a chance to respond and receive feedback
- teacher may give additional explanations, process feedback and explanations



- **Correctives and Feedbacks**

- **Quick, firm and correct responses are to be followed by:**

- (i) a question or**

- (ii) a short acknowledgement of correctness.**

- **Hesitant correct answers are to be followed by :**

- (i) process feedback**

Instructional Functions-4



- **Corrections can include:**
 - (i) sustaining feedback; i.e. simplifying the question, giving clues.**
 - (ii) explaining or reviewing steps**
 - (iii) giving process feedback**
 - **Try to elicit an improved response when the first one is incorrect**
 - **Praise should be used in moderation; specific praise is more effective than general praise.**

Instructional Functions-5



- **Independent Practice (Seatwork)**
 - **Sufficient practice**
 - Practice is directly relevant to skills / content taught
 - Practice to overlearning
 - ~ 95% correct rate
 - Students alerted that the seatwork will be checked
 - Student is held accountable for seatwork
 - Actively supervise students, when possible

Instructional Functions-6



- **Weekly and monthly review**
 - **Systematic review of previously learned materials**
 - **Include review in homework**
 - **Frequent tests**
 - **Reteaching of materials missed in tests.**



Conclusion of Direct Instruction-1

- **DI is a tool...**
 - **Know when to use it; when not to...**
 - **Know the conditions under which it is best used...**
 - **Don't use it all the time, or never**
 - **Don't use it for all kids, or none**



Conclusion of Direct Instruction-2

- **What are the 6 steps in a direct instruction lesson?**
 - **Focus/Review**
 - **Stated Objective**
 - **Teacher Input**
 - **Guided Practice**
 - **Independent Practice**
 - **Closure**
 - **Evaluation/Assessment**



Indirect Instruction

- **Constructivist**
- **Student-centered**
- **Science/Social Studies focused**
- **Learning Cycle, Five E, Structured Discovery, Inquiry**



Indirect Instruction Format

- **Rationale**
- **NCSCOS Objective(s)**
- **Instructional Objective**
- **Prerequisite Knowledge and Skills**
- **Materials**
- **Resources**
- **Technology**



Five E's

- Engage
- Explore
- Explain
- Elaborate
- Evaluate



Engage

- **Students first encounter and identify instructional task**
- **Make connections between past and present learning experiences**
- **Lay organizational ground work for activities**
- **Stimulate involvement in anticipation of**



Explore

- **Teacher acts as facilitator**
- **Students have opportunity to get directly involved with phenomena and materials**
- **Build base of common experiences which assists in sharing and communication**



Explain

- **Students begin to put abstract experience into communicable form**
- **Communication occurs between students and facilitator**
- **Articulation of ideas and explanations**
- **Create works such as writing, drawing, video, or tape recordings**



Elaborate

- **Students expand on concepts learned**
- **Make connections to other related concepts**
- **Apply understanding to world**
- **Share created work with peers**



Evaluate

- **On-going diagnostic process**
- **Allows teacher to determine if learner has attained an understanding of concepts and knowledge**
- **Rubrics, teacher observation, checklists, students interviews, projects, portfolios, problem-based learning products**



Things to Remember

- **Learning process is open-ended and open to change**
- **On-going loop where questions lead to answers**
- **More questions and instruction driven by both predetermined lesson design and inquiry process**

Three Sources of Teacher Behavior



- Communicators of Knowledge - implies mastery of both the knowledge to be communicated and the effective methods of communication.
- Models – implies that teachers should be competent and exciting individuals who will inspire in students a love of learning
- Symbols -

Modes of Representation



- **Enactive** – The infant knows the world only by acting on it; usually refers to the infancy period
- **Iconic** – Bruner's term for perceptual organization of the world – e.g. for a series of unrelated tasks, the discovery of a pattern makes the work easier.
- **Symbolic** – The ability to represent information, to consider possibilities; e.g. the child engages in symbolic activities such as language and mathematics.

Students Learn According to their Mode of Representation

- Learning involves 3 simultaneous processes:
 - Acquisition of new information
 - Transformation
 - Evaluation



Lesson Plan Design

Direct

- **Teacher Directed**
- **Teacher is focus**
- **Content is taught**
- **“I do, we do, you do”**
- **Stated Objective**
- **6-step format**

Indirect

- **Student Directed**
- **Student is focus**
- **Teacher is facilitator**
- **Problem solving is key**
- **Objective not stated**
- **Five E format**



Lesson Plan Formats

Direct – 6 Step

1. **Focus/Review**
Stated Objective
2. **Teacher Input**
3. **Guided Practice**
4. **Independent Practice**
5. **Closure**
6. **Evaluation/Assessment**

Indirect – Five E

- **Engage**
- **Explore**
- **Explain**
- **Elaborate**
- **Evaluate**

Review Activities

Review Activities

Previous

Next

Gagne's Outcomes of Learning-1



1. Verbal Information- e.g. stating

Newton's laws of motion

2. Intellectual Skills:

(i) **Discrimination**- e.g. distinguishing the printed letter 'd' from 'b'

(ii) **Concept formation**- naming apple as fruit and distinguishing it from other fruits

(iii) **Generalization of rule or principle**-
Demonstrating and concluding that matter expands after heating



Gagne's Outcomes of Learning-2

3. Cognitive strategy- Thinking and discovering a novel strategy for the purification of water
4. Motor skill- Learning to play harmonium
- 5 Attitude- Choosing teaching as a noble profession

Gagne's System of Learning-1



- 1. Signal learning
- 2. Stimulus-response (S.R) learning
- 3. Chaining
- 4. Verbal association
- 5. Multiple discrimination
- 6. Concept learning
- 7. Rule Learning
- 8. Problem solving



Gagne's System of Learning-2

Hierarchical Order	Type	Brief description of its nature
1.	Signal Learning	Learning to make a generalized response to a signal or stimulus (Pavlov)
2.	Stimulus-response (S.R.) learning	A stimulus is properly discriminated for a mechanical alike response (Thorndike)
3.	Chaining	Two or more S.R. connections are joined together

Gagne's System of Learning-3



Hierarchical Order	Type	Brief description of its nature
4.	Verbal association	Learner is made to emit chained responses of S.R. type by making verbal associations
5.	Multiple discrimination	To learn making different responses to different (even having too much resemblance) stimuli
6.	Concept learning	One learns to provide a common response to a class of stimuli

Gagne's System of Learning-4



Hierarchical Order	Type	Brief description of its nature
7.	Rule learning	Indicates the learning of principles which are generated through the chaining of two or more concepts.
8.	Problem solving	Higher mental or cognitive abilities are involved for making use of the concepts and rules for solving problems

Gagne's Learning Events-Corresponding Instructional Events



- **Reception** Gain attention
- **Expectancy** Informing learners of the objectives
- **Retrieval** Stimulating recall of prior learning
- **Selective perception** Presenting the stimulus
- **Semantic encoding** Providing learning guidance
- **Responding** Eliciting performance
- **Reinforcement** Providing feedback
- **Retrieval** Assessing performance
- **Generalization** Enhancing retention and transfer

Programmed Instruction (Skinner & Markle)

Programmed instruction (PI):

PI is a systematically planned, empirically established and effectively controlled self-instructional technique for providing individualized instruction to the learner through logically sequenced small segments of subject matter by using the principles of operent conditioning and schedules of reinforcement

Programmed Instruction: Example-Our Solar System



Frame 1:

The earth on which we live, is an important member of the family of our solar system. In the nucleus of this solar system is the Sun. It has eight planets (nowadays leaving the Pluto) revolving around it on account of gravitational force. The Earth is one of them that revolve the Sun on account of Force.

Response: *a round, gravitational*

Frame 2:

In addition to the eight planets, the satellites of these planets, comets meteors and asteroids also are the members of the All these planets and other heavenly bodies revolve around the in their own

Response: *Solar system; Sun; orbits*



Programmed Instruction (Skinner)-1

- **Teachers should be able to effectively control behavior**
- **It is necessary to bring responses under stimulus control**

How ?

Through use of positive reinforcement:

- ❖ **Define terminal behavior (what the teachers want students to do after teaching) and**
- ❖ **Strengthen it by reinforcement**

Programmed Instruction (Skinner)-2



Options are:

- To induce it
- To have pupils imitate the teacher or some example of excellent work
- Simply telling pupils what to do and then reinforcing them

(N.B.- Learning does not occur because the teacher has primed the behavior, it occurs only when behavior is reinforced)

Programmed Instruction (Skinner)-3



- Prepare small steps which are needed to ensure constant reinforcement
- Decide the most effective sequence of steps of the program
- Ensure proper student preparation for each step
- Ensure an orderly arrangement of steps
- Employ much smaller and more intricate units than ideas
- Use questions liberally considering questions difficulty (N.B.- Questions help students attend relevant cues)

Programmed Instruction (Skinner)- 4



- **Use multiple examples**
- **Stretch the concept**
- **Try to prevent incorrect responses**
(N.B.- Children will repeat mistakes in similar situations)
- **Be clear in responding correct and incorrect answers**
- **Provide nonthreatening but clear feedback**

Programmed Instruction (Markle)- 1



Too rigid adherence to the early views:

- Small steps
- Heavy Prompting, and
- Verbatim Student Responses to oft-repeated sentences



Contributed to the criticism of the system

Programmed Instruction (Markle)- 2



Three Important Programing Principles:

➤ Active responding:

Student learns what the student does

Meaningful responses are covert, overt or verbal

➤ Errorless Learning:

Errors serve following functions-

They can be signals that instruction needs improvement

They are a reliable guide for diagnosis

They aid programers in shaping the final form of a program

➤ Immediate Feedback: Markle linked the need for for feedback to the manner in which the statement is framed.

Component Instructional Skills-1



I. Planning stage:

1. Writing instructional objectives
2. Selecting the content
3. Organizing the content
4. Selection of audio-visual aid

II. Introductory stage:

5. Creating set for introducing lesson
6. Introducing the lesson

III. Presentation stage:

(a) Questioning skills:

7. Structured classroom questions
8. Fluency in questioning
9. Probing questions
10. Questions-delivery and distribution
11. Use of higher-order questions
12. Divergent questions
13. Response management

Component Instructional Skills-2



(b) Presentation skills: 14. Pacing the lesson

15. Lecturing

16. Explaining

17. Discussing

18. Demonstrating

19. Illustrating with examples

(c) Aid-using skills:

20. Using teaching aids

21. Using blackboard

22. Stimulus variation

23. Reinforcement

24. Promoting pupil participation

25. Reorganizing attending behavior

26. Management of the class

Component Instructional Skills-3



IV. Closing stage: 27. Planned repeatation

28. Giving assignments

29. Evaluating the pupil's progress

30. Diagnosing the pupil's learning difficulties and taking remedial measures