DIRECT TEACHING

Direct instruction is an instructional method proposed by Siegfried Engelmann, primarily for students of lower social classes. Using highly scripted lessons and "direct feedback" it aims to accelerate learning by avoiding digressions or disruptions. It is primarily marketed in the United States, with the DISTAR program for reading education being the most financially successful example. By promoting a strong focus on basic mechanical skills such as phonics, direct instruction aims to avoid distractions. Proponents of the method say that this is the best technique to teach many children.

One explanation of the method identifies the following key points[1]

- Learners divided into small "ability groups"
- Attention focused on the teacher
- Carefully-scripted, rapid-fire "faultless instruction" by teacher
- Constant engagement and active response by all, as cued by teacher
- Frequent feedback and correction
- High pace

It is important to note that when the phrase "direct instruction" in used in pedagogical contexts, it is this specific instructional design and highly stylized method which is being discussed, not other modes of teacher-led or facilitated instruction such as lecture, seminar or lessons.

Advantages	Disadvantages	Preparation
Very specific learning targets. Students are told reasons why content is important - helps to clarify lesson objective. Relatively easy to measure student gains. Is a widely accepted instructional method. Good for teaching specific facts and basic skills.	Can stifle teacher creativity. Requires well-organized content preparation and good oral communication skills. Steps must be followed in prescribed order. May not be effective for higher-order thinking skills, depending on the knowledge base and skill of the teacher.	Content must be organized in advance. Teacher should have information about student prerequisites for the lesson.

COOPERATIVE LEARNING

Cooperative learning was proposed in response to traditional curriculum-driven education. In cooperative learning environments, students interact in purposely structured heterogeneous group to support the learning of one self and others in the same group.

Cooperative learning focuses on opportunities to encourage both individual flexibility and affinity to a learning community (Paulsen 2003). Cooperative learning seeks to foster some benefits from the freedom of individual learning and other benefits from collaborative learning. Cooperative learning explicitly builds cooperation skills by assigning roles to team members and establishing norms for conflict resolution via arbitration. Cooperative learning should also provide the means for group reflection and individual self-assessment.

> "Cooperative learning (CL) is an instructional paradigm in which teams of students work on structured tasks (e.g., homework assignments, laboratory experiments, or design projects) under conditions that meet five criteria: positive interdependence, individual accountability, face-to-face interaction, appropriate use of collaborative skills, and regular self-assessment of team functioning. Many studies have shown that when correctly implemented, cooperative learning improves information acquisition and retention, higher-level thinking skills, interpersonal and communication skills, and self-confidence (Johnson, Johnson, and Smith, 1998)."

Advantages	Disadvantages	Preparation
Helps foster mutual responsibility. Supported by research as an effective technique. Students learn to be patient, less critical and more compassionate.	Some students don't work well this way. Loners find it hard to share answers. Aggressive students try to take over. Bright students tend to act superior.	Decide what skills or knowledge are to be learned. Requires some time to prepare students. to learn how to work in groups.

LECTURE

A **lecture** is an oral presentation intended to teach people about a particular subject, for example by a university or college teacher. Lectures are used to convey critical information, history, background, theories and equations. A politician's speech, a minister's sermon, or even a businessman's sales presentation may be similar in form to a lecture. Usually the lecturer will stand at the front of the room and recite information relevant to the lecture's content.

Though lectures are much criticized, many schools have not yet found practical alternative teaching methods for the large majority of their courses. Critics see lecturing as a one-way method of communication, which does not involve significant audience participation. Lecturing is often contrasted to active learning. But lectures have nevertheless survived in academia, mainly as a quick, cheap and efficient way of introducing large numbers of students to a particular field of study.

Advantages	Disadvantages	Preparation
Factual material is presented in a direct, logical manner. May provide experiences that inspire - useful for large groups.	Proficient oral skills are necessary. Audience is often passive. Learning is difficult to gauge. Communication is one-way. Not appropriate for children below grade 4.	There should be a clear introduction and summary. Effectiveness related to time and scope of content. Is always audience specific; often includes examples, anecdotes.

LECTURE WITH DISCUSSION

Advantages	Disadvantages	Preparation
Involves students, at least after the lecture. Students can question, clarify and challenge. Lecture can be interspersed with discussion.	Time constraints may affect discussion opportunities. Effectiveness is connected to appropriate questions and discussion; often requires teacher to "shift gears" quickly.	Teacher should be prepared to allow questions during lecture, as appropriate. Teacher should also anticipate difficult questions and prepare appropriate responses in advance.

BRAINSTORMING

Brainstorming is an organized approach for producing ideas by letting the mind think without interruption. The term was coined by Alex Osborn.

Overview

Brainstorming can be done either individually or in a group; in group brainstorming sessions, the participants are encouraged, and often expected, to share their ideas with one another as soon as they are generated. The key to brainstorming is not to interrupt the thought process. As ideas come to the mind, they are captured and stimulate the development of better ideas. Brainstorming is used for enhancing creativity in order to generate a broad selection of ideas in leading to a unique and improved concept.

It is a means of enhancing divergent production, aiming to facilitate problem solving through the maxim *quantity breeds quality*. The greater the number of ideas generated, the greater the chance of producing a radical and effective solution.

When done individually brainstorming can be an effective measure of change through time. An individual may revisit a brainstorm, done alone, and approach it with a slightly new perspective. This process can be repeated without limit. The result is collaboration with your past, present and future selves.

In a group, it is often emphasized in brainstorming sessions that you should put criticism 'on hold'. Instead of immediately stating what might be wrong with an idea, the participants focus on extending or adding to it, reserving criticism for a later 'critical stage' of the process. The assertion is that when suspending judgment, you create a supportive atmosphere where participants feel free to generate unusual ideas. However, persistent respectful criticism of ideas by a minority dissenter can reduce groupthink, leading to more and better quality ideas.

Brainstorming has many applications but it is most frequently used in:

- New product development - obtaining ideas for new products and making improvements to existing products
- Advertising - developing ideas for advertising campaigns
- Joint Application design - speeds every step of JAD
- Problem Solving - issues, root causes, alternative solutions, impact analysis, evaluation
- Process management - finding ways of improving business and production processes
- Project Management - identifying client objectives, risks, deliverables, work packages, resources, roles and responsibilities, tasks, issues
- Team building - generates sharing and discussion of ideas while stimulating participants to think

Procedure for a typical brainstorming session

- A moderate size room is equipped with about a dozen chairs in the shape of a hollow square so that each participant is looking at the others in the group. A flip chart, blackboard, or overhead projector is placed in a prominent location. The room is free of telephones, clocks, or any other distractions.

- Between six and twenty people with an interest in the subject (although not necessarily experts) are invited to participate. Osborn (1957) recommended that individual ideation should occur during preparation, prior to the group session.

- Write on the flip chart (or blackboard) a statement of the subject or problem that will be discussed. This is often presented as a question.

- Have everyone write their ideas on post-it notes. Post and organize these ideas on flip charts. A single topic can be brainstormed within an hour. An older method of having one recorder write the ideas on flip charts is much slower. Everyone had to wait until the recorder finishes the last idea. Ideas should be written concisely but without paraphrasing. The recorder should state the idea in the words she has written to confirm that it expresses the meaning intended by the originator.

- Choose one person to facilitate the process. This involves encouraging participation by everyone and maintaining a criticism free, uninhibited atmosphere. Encourage even wild and seemingly ridiculous ideas.

- After 5 to 20 minutes the facilitator calls an end to the idea generation phase.

- Organize the ideas based on the topic goal. The facilitator encourages discussion during this phase. Additional ideas may be generated.

- Group sub ideas under main categories.

- After each topic advance to the next topic to be brainstormed.

- Review the list from top to bottom to ensure everyone understands the ideas. Eliminate from the list any duplications. Remove any obviously ridiculous suggestions.

- Thank all participants and give them each a token recompense as a sign of appreciation.

Advantages	**Disadvantages**	**Preparation**
Listening exercise that allows creative thinking for new ideas. Encourages full participation because all ideas are equally recorded. Draws on group's knowledge and experience. Spirit of cooperation is created. One idea can spark off other ideas.	Can be unfocused. Needs to be limited to 5 - 7 minutes. Students may have difficulty getting away from known reality. If not managed well, criticism and negative evaluation may occur. Value to students depends in part on their maturity level.	Teacher selects issue. Teacher must be ready to intervene when the process is hopelessly bogged doen.

VIDEOTAPES/SLIDES

Advantages	Disadvantages	Preparation
Entertaining way of introducing content and raising issues Usually keeps group's attention Looks professional Stimulates discussion	Can raise too many issues to have a focused discussion Discussion may not have full participation Most effective when following discussion	Need to obtain and set up equipment Effective only if teacher prepares for discussion after the presentation

DISCUSSION

Advantages	Disadvantages	Preparation
Pools ideas and experiences from group Effective after a presentation, film or experience that needs to be analyzed Allows everyone to participate in an active process	Not practical with more that 20 students A few students can dominate Some students may not participate Is time consuming Can get off the track	Requires careful planning by teacher to guide discussion Requires question outline

SMALL GROUP DISCUSSION

Advantages	Disadvantages	Preparation
Allows for participation of everyone Students often more comfortable in small groups Groups can reach consensus	Needs careful thought as to purpose of group Groups may get side tracked	Need to prepare specific tasks or questions for group to answer

CASE STUDIES

What Is a Case Study?

It is now documented that students can learn more effectively when actively involved in the learning process (Bonwell and Eison, 1991; Sivan et al, 2001). The case study approach is one way in which such active learning strategies can be implemented in our institutions. There are a number of definitions for the term case study. For example, Fry et al (1999) describe case studies as complex examples which give an insight into the context of a problem as well as illustrating the main point. Educational research has shown case studies to be useful pedagogical tools. Grant (1997) outlines the benefits of using case studies as an interactive learning strategy, shifting the emphasis from teacher-centred to more student-centred activities. Case studies have also been linked with increased student motivation and interest in a subject (Mustoe and Croft, 1999). In our experience of using case studies, we have found that they can be used to:

- Allow the application of theoretical concepts to be demonstrated, thus bridging the gap between theory and practice.
- Encourage active learning.
- Provide an opportunity for the development of key skills such as communication, group working and problem solving.
- Increase the students' enjoyment of the topic and hence their desire to learn.

Advantages	Disadvantages	Preparation
Develops analytic and problem solving skills Allows for exploration of solutions for complex issues Allows student to apply new knowledge and skills	Students may not see relevance to own situation Insufficient information can lead to inappropriate results Not appropriate for elementary level	Case must be clearly defined Case study must be prepared

ROLE PLAYING

Role-playing can be thought of as unstructured drama (Dallman-Jones *et al.*, 1994). In these exercises, a student looks at the topic from the perspective of a character, who will affect and be affected by the topic. The setting and the characters are provided by the instructor, but the students have to decide their characters' lines and directions. Generally, the students will need to do some research to make informed decisions from their characters' perspectives. This research opportunity can easily become an inquiry element.

Role-playing exercises teach skills that are often assumed to be learned outside of the classroom (and sometimes aren't), and how to use those skills to complement scientific knowledge. These exercises require the students to use imagination, background knowledge appropriate to the character being role-played, and communications skills.

Why Use Role-Playing?

Role-playing is simultaneously interesting and useful to students because it emphasizes the "real-world.". It challenges them to deal with complex problems with no single "right" answer and to use a variety of skills beyond those employed in a typical research project. In particular, role-playing presents the student a valuable opportunity to learn not just the course content, but other perspectives on it.

How to Teach Using Role-Playing

The instructor needs to decide the context for the exercise and the role(s) that the students will play. If the students are taking human roles, the context is generally a specific problem such as global warming or dealing with an active volcano. Lessons need to be carefully explained and supervised in order to involve the students and to enable them to learn as much as possible from the experience. However, a well-done scenario never runs the same way twice, teaches people things they might not ordinarily have learned, and tends to be fun for all involved.

Advantages	Disadvantages	Preparation
Introduces problem situation dramatically Provides opportunity for students to assume roles of others and thus appreciate another point of view Allows for exploration of solutions Provides opportunity to practice skills	Some students may be too self-conscious Not appropriate for large groups Some students may feel threatened	Teacher has to define problem situation and roles clearly Teacher must give very clear instructions

WORKSHEET/SURVEYS

Advantages	Disadvantages	Preparation
Allows students to think for themselves without being influenced by others Individual thoughts can then be shared in large group	Can be used only for short period of time	Teacher has to prepare handouts

GUEST SPEAKERS

Advantages	Disadvantages	Preparation
Personalizes topic Breaks down audience's stereotypes	May not be a good speaker	Contact speakers and coordinate Introduce speaker appropriately

VALUES CLARIFICATION

Advantages	Disadvantages	Preparation
Opportunity to explore values and beliefs Allows students to discuss values in a safe environment Gives structure to discussion	Students may not be honest about their values. Students may be too self-conscious. Students may not be able to articulate their values in an effective way.	Teacher must carefully prepare exercise Teacher must give clear instructions Teacher must prepare discussion questions

PANEL OF EXPERTS

Advantages	Disadvantages	Preparation
Experts present different opinions. Can provoke better discussion than a one person discussion. Frequent change of speaker keeps attention from lagging.	Personalities may overshadow content. Experts are often not effective speakers. Subject may not be in logical order. Not appropriate for elementary age students. Logistics can be troublesome.	Teacher coordinates focus of panel, introduces and summarizes. Teacher briefs panel.