UNIT – IV : LEARNING METHOD

Unit 4: Methods of learning *: Types - individual and group methods – innovative methods, new trends in learning use of computer and networking – Influence of methods on active engagement and inquiry in Learning – activity based learning – social learning – constructivism in learning – problem solving, discovery learning, mastery learning, individual and peer group learning – factors affecting learning*

Introduction

A **learning method** comprises the principles and methods used for instruction to be implemented by teachers to achieve the desired learning in students. These strategies are determined partly on subject matter to be taught and partly by the nature of the learner. For a particular learning method to be appropriate and efficient it has to be in relation with the characteristic of the learner and the type of learning it is supposed to bring about. Davis (1997) suggests that the design and selection of learning methods must take into account not only the nature of the subject matter but also how students learn. In today's school the trend is that it encourages a lot of creativity. It is a known fact that human advancement comes through reasoning. This reasoning and original thought enhances creativity.

The approaches for learning can be broadly classified into teacher centered and student centered. In Teacher-Centered Approach to Learning, Teachers are the main authority figure in this model. Students are viewed as "empty vessels" whose primary role is to passively receive information (via lectures and direct instruction) with an end goal of testing and assessment. It is the primary role of teachers to pass knowledge

and information onto their students. In this model, learning and assessment are viewed as two separate entities. Student learning is measured through objectively scored tests and assessments.

In Student-Centered Approach to Learning, while teachers are an authority figure in this model, teachers and students play an equally active role in the learning process. The teacher's primary role is to coach and facilitate student learning and overall comprehension of material. Student learning is measured through both formal and informal forms of assessment, including group projects, student portfolios, and class participation. Learning and assessments are connected; student learning is continuously measured during teacher instruction.[2] Commonly used learning methods may include class participation, demonstration, recitation, memorization, or combinations of these.

Mastery Learning

Mastery Learning (or as it was initially called, "learning for mastery") is an instructional strategy and educational philosophy, first formally proposed by Benjamin S. Bloom in 1968. Mastery Learning maintains that students must achieve a level of mastery (i.e. 90% on a knowledge test) in prerequisite knowledge before moving forward to learn subsequent information. If a student does not achieve mastery on the test, they are given additional support in learning and reviewing the information, then tested again. This cycle will continue until the learner accomplishes mastery, and may move on to the next stage.

Mastery learning methods suggest that the focus of instruction should be the time required for different students to learn the same material and achieve the same level of mastery. This is very much in contrast with classic models of teaching, which focus more on differences in students' ability and where all students are given approximately the same amount of time to learn and the same set of instructions.

In **Mastery learning**, there is a shift in responsibilities, so that student's failure is more due to the instruction and not necessarily lack of ability on his or her part. Therefore, in a mastery learning environment, the challenge becomes providing enough time and employing instructional strategies so that all students can achieve the same level of learning.

Definition

Mastery learning is a set of group-based, individualized, teaching and learning strategies based on the premise that students will achieve a high level of understanding in a given domain if they are given enough time

Motivation

The motivation for Mastery Learning comes from trying to reduce achievement gaps for students in average school classrooms. During the 1960s John B. Carroll and Benjamin S. Bloom pointed out that, if students are normally distributed with respect to aptitude for a subject and if they are provided uniform instruction (in terms of quality and learning time), then achievement level at completion of the subject is also expected to be normally distributed. This can be illustrated as shown below:

Mastery Learning approaches propose that, if each learner were to receive optimal quality of instruction and as much learning time as they require, then a majority of students could be expected to attain mastery. This situation would be represented as follows:

In many situations educators preemptively use the normal curve for grading students. Bloom was critical of this usage, condemning it because it creates expectation by the teachers that some students will naturally be successful while others will not. Bloom defended that, if educators are effective, the distribution of achievement could and should be very different from the normal curve. Bloom proposed Mastery Learning as a way to address this. He believed that by using his approach, the majority of students (more than 90 percent) would achieve successful and rewarding learning. As an added advantage, Mastery Learning was also thought to create more positive interest and attitude towards the subject learned if compared with usual classroom methods.

Variables of Learning for Mastery

Bloom, when first proposing his mastery learning strategy in 1968, was convinced that most students can attain a high level of learning capability if the following conditions are available:

- instruction is approached sensitively and systematically
- students are helped when and where they have learning difficulties
- students are given sufficient time to achieve mastery
- there is some clear criterion of what constitutes mastery.

Many variables will influence achievement levels and learning outcomes:

Aptitude

Aptitude, measured by standard aptitude tests, in this context is interpreted as "the amount of time required by the learner to attain mastery of a learning task". Several studies show that majority of students can achieve mastery in a learning task, but the time that they need to spend on is different. Bloom argues that there are 1 to 5 percent of students who have special talent for learning a subject (especially music and foreign languages) and there are also around five percent of students who have special disability for learning a subject. For other 90% of students, aptitude is merely an indicator of the rate of learning. Additionally, Bloom argues that attitude for a learning task is not constant and can be changed by environmental conditions or learning experience at school or home.

Quality of instruction

The quality of instruction is defined as the degree to which the presentation, explanation, and ordering of elements of the task to be learned approach the optimum for a given learner. Bloom insists that the quality of instruction has to be evaluated according to its effect on individual students rather than on random groups of students. Bloom shows that while in traditional classrooms, the relationship between students aptitude test for mathematics and their final grade in algebra is very high, this relationship is almost zero for students who are receiving tutorial instruction in the home. He argues that a good tutor tries to find the quality of learning best fit to the given students, thus majority of students would be able to master a subject if they have access to a good tutor.

Ability to understand instruction

According to Bloom the ability to understand instruction is defined as the nature of the task that a learner is to learn and the procedure that the learner is to follow. Verbal ability and reading comprehension are two language abilities that are highly related to student achievements. Since the ability to understand instruction varies significantly among students, Bloom recommends that teachers modify their instruction, provide help, and teaching aids to fit the needs of different students. Some of the teaching aids that could be provided according to the ability of the learner are:

a. Alternative Textbooks
b. Group Studies and Peer Tutoring
c. Workbooks
d. Programmed Instruction Units
e. Audiovisual Methods
f. Academic Games
g. Laboratory experiences
h. Simple demonstrations
i. Puzzles

Perseverance

Perseverance in this context is defined as the time the learner is willing to spend in learning. According to Bloom, a student who demonstrate low level of perseverance in one learning task might have a very high level of perseverance in a different learning task. He suggests that perseverance of students could be enhanced by increasing the frequency of reward and providing evidence of success in learning. He recommends that teachers use frequent feedback accompanied by specific help to improve the quality of instruction, thus reduce the perseverance required for learning.

Time allowed for learning

According to the International Study of Education in 12 countries, if the top 5% of students are omitted, the ratio of the time needed for slower and faster learners of a subject such as mathematics is 6 to 1 while there is zero or slightly negative relationship between the final grades and the amount of time spent on homework. Thus, the amount of time spent on homework is not a good indicator of mastery in a subject. Bloom postulates that the time required for a learner to achieve mastery in a specific subject is affected by various factors such as:

a) the student's aptitude for that subject,
b) The student's verbal ability,
c) the quality of instruction, and
d) the quality of the help provided.

Mastery Learning is one of the most highly investigated teaching methods over the past 50 years. While it has been the subject of high criticism, it has also been found to have resounding success when implemented correctly. A meta-analysis by Guskey & Pigott (1988) looked at 46 studies that implemented group-based mastery learning classrooms. Results found consistently positive effects for a number of variables including "student achievement, retention of learned material, involvement in learning activities, and student affect". However, a notable variation was found within student achievement and it was believed this was due mainly to the subject being taught. Courses such as science, probability, and social studies yielded the most consistent positive results, while other subjects were varied.

Individual learning is training that is individualised to take into consideration the differences between learners. It is most appropriately used in a one-to-one situation, such as training successors or team members in the workplace. Unlike facilitated learning where the trainer takes a more passive role, with individual learning the trainer needs to consider and cater for the needs of individual participants for example:

- Rates of learning and learning style
- Attitude
- Maturity
- Interests which effect the level of learning
- Motivation
- Learning environment

It doesn't necessarily mean learners are at home — they can be in a classroom and still work through things at their own pace.

The main types of individual learning are:

- Distance learning
- Resource-based learning
- Computer-based training
- Directed private study

The advantages are:

- Many learner differences can be taken into account
- Learners can work at their own pace at the time most convenient to them
- Different learning styles can be accommodated
- It is cost-effective for large number of learners
- Learners are more in control of how and what they learn
- It is active not passive learning

There are some disadvantages:

- There is a long lead time to prepare materials
- Learner motivation can be hard to maintain
- The trainer's role needs to change

This kind of training is probably most appropriate when the trainer is providing on-the-job training for one or a small number of colleagues. It is a good idea to link the training to practical exercises based on the working need — for example, planning a record survey, drawing up appraisal guidelines etc. It can also be very effective to provide this kind of training as a follow-up to face-to-face training.

GROUP LEARNING

DEFINITION

A collection of persons who are emotionally, intellectually, and aesthetically engaged in solving problems, creating products, and making meaning—an assemblage in which each person learns autonomously and through the ways of learning of others. By group, we refer both to the learning of individuals that is fostered by being in a group and to a more distributed kind of learning that does not reside inside the head of any one individual. Rather than focusing only on what the individual knows, the goal is to build a collective body of knowledge; learning groups strive to create publicly shared

understandings. By learning, we refer to the learning processes and outcomes involved in solving problems and creating products that are considered meaningful in a culture (Gardner, 1983). Rather than focusing on discrete bits of information that can be produced via simple-answer questions, this type of learning is situated in real-world problem solving and engages students cognitively, emotionally, and aesthetically.

FOUR FEATURES OF GROUP LEARNING

1. The members of learning groups include adults as well as children.

2. Documenting children's learning processes helps to make learning visible and shapes the learning that takes place.

3. Members of learning groups are engaged in the emotional and aesthetic as well as the intellectual dimensions of learning.

4. The focus of learning in learning groups extends beyond the learning of individuals to create a collective body of knowledge.

What is collaborative learning?

Collaborative learning is based on the view that knowledge is a social construct. Collaborative activities are most often based on four principles:

- The learner or student is the primary focus of instruction.
- Interaction and "doing" are of primary importance
- Working in groups is an important mode of learning.
- Structured approaches to developing solutions to real-world problems should be incorporated into learning.

Collaborative learning can occur peer-to-peer or in larger groups. Peer learning, or peer instruction, is a type of collaborative learning that involves students working in pairs or small groups to discuss concepts, or find solutions to problems. This often occurs in a class session after students are introduced to course material through readings or videos before class, and/or through instructor lectures. Similar to the idea that two or three heads are better than one, many instructors have found that through peer instruction, students teach each other by addressing misunderstandings and clarifying misconceptions.

Group work or collaborative learning can take a variety of forms, such as quick, active learning activities in class or more involved group projects that span the course of a semester.

Impact of collaborative learning

Research shows that educational experiences that are active, social, contextual, engaging, and student-owned lead to deeper learning. The benefits of collaborative learning include:

- Development of higher-level thinking, oral communication, self-management, and leadership skills.
- Promotion of student-faculty interaction.
- Increase in student retention, self-esteem, and responsibility.
- Exposure to and an increase in understanding of diverse perspectives.
- Preparation for real life social and employment situations.

Examples of collaborative learning

Stump your partner

- Students take a minute to create a challenging question based on the lecture content up to that point.
- Students pose the question to the person sitting next to them.
- To take this activity a step further, ask students to write down their questions and hand them in. These questions can be used to create tests or exams. They can also be reviewed to gauge student understanding.

Think-pair-share/ Write-pair-share

- The instructor poses a question that demands analysis, evaluation, or synthesis.
- Students take a few minutes to think through an appropriate response.
- Students turn to a partner (or small groups) and share their responses. Take this a step further by asking students to find someone who arrived at an answer different from their own and convince their partner to change their mind.
- Student responses are shared within larger teams or with the entire class during a follow-up discussion.

i. Catch-up

- Stop at a transition point in your lecture.
- Have students turn to a partner or work in small groups to compare notes and ask clarifying questions.
- After a few minutes, open the floor to a few questions.

- Fishbowl debate
- Ask students to sit in groups of three.
- Assign roles. For example, the person on left takes one position on a topic for debate, the person on right takes the opposite position, and the person in the middle takes notes and decides which side is the most convincing and provides an argument for his or her choice.
- Debrief by calling on a few groups to summarize their discussions.

ii. Case study

- Create four to five case studies of similar difficulty.
- Have students work in groups of four or five to work through and analyze their case study.
- Provide 10-15 minutes (or adequate time to work through the cases).
- Walk around and address any questions.
- Call on groups randomly and ask that students share their analysis. Continue until each case study has been addressed.

Team-based learning (adapted from L.K. Michaelsen in Davis, 2009. p.215)

- Start a course unit by giving students some tasks to complete, such as reading or lab assignments. Consider assigning these to be completed before class.
- Check students' comprehension of the material with a quick multiple-choice quiz. Have students submit their answers.
- Assign students to groups and have them review their answers with group members to reach consensus. Have each group submit one answered quiz.
- Record both the individual student assessment scores and the final group assessment score (both of which are used toward each student's course grade).
- Deliver a lecture that specially targets any misconceptions or gaps in knowledge the assessments reveal.
- Give groups a challenging assignment, such as solving a problem or applying a theory to a real world situation.
- For more information on this strategy at teambasedlearning.org.

Group problem solving

There are many instructional strategies that involve students working together to solve a problem, including inquiry based learning, authentic learning, and discovery learning. While they each have their own unique characteristics, they all fundamentally involve:

- Presenting students with a problem.

- Providing some structure or guidance toward solving the problem. Note, however, that they are all student-centered activities in which the instructor may have a very minimal role.
- Reaching a final outcome or solution.

PROBLEM-BASED LEARNING

Problem-Based Learning is a collaborative, student-centered approach to learning in which students learn about a subject by working in groups to solve an open-ended problem.

Inquiry-based learning (also **enquiry-based learning** in British English)[1] starts by posing questions, problems or scenarios—rather than simply presenting established facts or portraying a smooth path to knowledge. The process is often assisted by a facilitator. Inquirers will identify and research issues and questions to develop their knowledge or solutions. Inquiry-based learning includes problem-based learning, and is generally used in small scale investigations and projects, as well as research.[2] The inquiry-based instruction is principally very closely related to the thinking and its development.[3]

Characteristics

specific learning processes that people engage in during inquiry-learning include:

1. Creating questions of their own
2. Obtaining supporting evidence to answer the question(s)
3. Explaining the evidence collected
4. Connecting the explanation to the knowledge obtained from the investigative process
5. Creating an argument and justification for the explanation

Inquiry learning involves developing questions, making observations, doing research to find out what information is already recorded, developing methods for experiments, developing instruments for data collection, collecting, analyzing, and interpreting data, outlining possible explanations and creating predictions for future study.[15]

Classroom Applications of Inquiry Learning

As we all know, that over the last decade, inquiry based learning has become pretty much impressive and is being used as a leading approach in the classrooms. Inquiry based learning is mainly getting involved through questions, which leads to understand. Inquiry in term is defined as a way of seeking information, knowledge, or truth through questioning. Mainly, inquiry is a way for a learner to acquire new information and data and turn it into useful knowledge. Every person starts the process of enquiry from its birth till its death, he or she gathers information and data and then passes it on the useful knowledge to its senses like smelling, tasting, touching, hearing, and seeing.

Traditional way of teaching is more focused on making the students listening and repeating the expected answer to the teacher's question rather than letting them inquire about the lesson plans. In this way of teaching, the teacher's resources are limited. The main ingredients in the teacher's worksheet are to teach about the technology rather than the application of the technology. Hence, when someone inquires about the applications related to the technology which is somewhat off track from the worksheet, the only reply the person gets is "We will get back to that later."

Moving towards the classroom applications of inquiry, it depends upon different factors, which are all equally important.

Factors affecting Learning

Instructional design is largely affected by how a user learns:
Meaningfulness effect Highly meaningful words are easier to learn and remember than less meaningful words. This is true whether meaningful is measured by
1) the number of associations the learner has for the word,
2) by frequency of the word
3) or by familiarity with the sequential order of letters,
4) or the tendency of the work to elicit clear images.
An implication is that retention will be improved to the extent the user can make meaning of the material.

Serial position effects Serial position effects result from the particular placement of an item within a list. Memory is better for items placed at beginning or end of list rather than in the middle. An exception to these serial positions is the distinctiveness effect - an item that is distinctively different from the others will be remembered better, regardless of serial position.

Practice effects Active practice or rehearsal improves retention, and distributed practice is usually more effective than massed practice. The advantage to distributed practice is especially noticeable for lists, fast presentation rates or unfamiliar stimulus material. The advantage to distributed practice apparently occurs because massed practice allows the learner to associate a word with only a single context, but distributed practice allows association with many different contexts.

Transfer effects Transfer effects are effects of prior learning on the leaning of new material. Positive transfer occurs when previous learning makes new learning easier. Negative transfer occurs when it makes the new learning more difficult. The more that two tasks have in common, the more likely that transfer effects occur.

Interference effects. Interference effects occur when memory or particular material is hurt by previous or subsequent learning. Interference effects occur when trying to remember material that has previously been learned. Interference effects are always negative.

Organization effects Organization effects occur when learners chunk or categorize the input. Free recall of lists is better when learners organize the items into categories rather than attempt to memorize the list in serial order.

Levels-of-Processing effects The more deeply a word is processed, the better it will be remembered. Semantic encoding of content is likely to lead to better memory. Elaborative encoding, improves memory by making sentences more meaningful.

State-Dependent effects State- or Context-dependent effects occur because learning takes place in within a specific context that must be accessible later, at least initially, within the same context. For example, lists are more easily remembered when the test situation more closely resembles the leaning situation, apparently due to contextual cues available to aid in information retrieval.

Mnemonic effects Mnemonics - strategies for elaborating on relatively meaningless input by associating the input with more meaningful images or semantic context. Four well-known mnemonic methods are the place method, the link method, the peg method and the keyword method.

Abstraction effects Abstraction is the tendency of learners to pay attention to and remember the gist of a passage rather than the specific words of a sentence. In general, to the extent that learners assume the goal is understanding rather than verbatim memory and the extent that the material can be analyzed into main ideas and supportive detail, learners will tend to concentrate on the main ideas and to retain these in semantic forms that are more abstract and generalized than the verbatim sentences included in the passage.

Levels effect This effect occurs when the learner perceives that some parts of the passage are more important than others. Parts that occupy higher levels in the organization of the passage will be learned better than parts occupying low levels.

Prior Knowledge effects Prior knowledge effects will occur to the extent that the learner can use existing knowledge to establish a context or construct a schema into which the new information can be assimilated.

Inference effects Inference effects occur when learners use schemas or other prior knowledge to make inferences about intended meanings that go beyond what is explicitly stated in the text. Three kinds of

inferences are case grammar pre-suppositions, conceptual dependency inferences and logical deductions.

Student misconception effects. Prior knowledge can lead to misconceptions. Misconceptions may be difficult to correct due to fact that learner may not be aware that knowledge s a misconception. Misconception occurs when input is filtered through schemas that are oversimplified, distorted or incorrect.

Text Organization Effects Text organization refers to the effects that the degree and type of organization built into a passage have on the degree and type of information that learners encode and remember. Structural elements such as advanced organizers, previews, logical sequencing, outline formats, higlighting of main ideas and summaries assist learning in retaining information. These organization effects facilitate chunking, subsumption of material into schemas and related processes that enable encoding as an organized body of meaningful knowledge. In addition, text organization elements cue learners to which aspects of the material are most important.

Mathemagenic Effects

Mathemagenic effects, coined by Rothkopf (1970) , refer to various things that learners do to prepare and assist their own learning. These effects refer to the active information processing by learners. Mathemagenic activities include answering adjunct questions or taking notes and can enhance learning.

Social learning

Meaning

Social learning, in psychological theory, learning behaviour that is controlled by environmental influences rather than by innate or internal forces. The leading exponent of the concept of social learning, often called modeling, is the American psychologist Albert Bandura, who has undertaken innumerable studies showing that when children watch others they learn many forms of behaviour, such as sharing, aggression, cooperation, social interaction, and delay of gratification. In Bandura's classic study of imitation learning, children who saw a model punished for aggressive behaviour tended to exhibit fewer aggressive responses than children who saw the model rewarded for such behaviour, or than those who saw the model neither rewarded nor punished. Bandura's research has led some psychologists to question the potential "learning experiences" offered children by popular television shows and motion pictures, particularly those shows in which antisocial or violent behaviour is presented. Subsequent research on the effects of violence in the media has been controversial. Two opposing theories have been propagated; one claims that the viewing of violence will allow such drives to be sublimated (experienced vicariously, thereby lessening the drive), while the other claims that such viewing merely increases the drive. Evidence appears to favour the latter theory.

Psychologists following Bandura have stated that social learning based on observation is a complex process that involves three stages: exposure to the responses of others; acquisition of what an individual sees; and subsequent acceptance of the modeled acts as a guide for one's own behaviour.

Constructivism

Constructivism is a learning theory found in psychology which explains how people might acquire knowledge and learn. It therefore has direct application to education. The theory suggests that humans construct knowledge and meaning from their experiences. Constructivism is not a specific pedagogy. Piaget's theory of Constructivist learning has had wide ranging impact on learning theories and teaching methods in education and is an underlying theme of many education reform movements. Research support for constructivist teaching techniques has been mixed, with some research supporting these techniques and other research contradicting those results.

Formalization of the theory of constructivism is generally attributed to Jean Piaget, who articulated mechanisms by which knowledge is internalized by learners. He suggested that through processes of **accommodation** and **assimilation**, individuals construct new knowledge from their experiences.

Constructivist learning intervention

The nature of the learner

Social constructivism not only acknowledges the uniqueness and complexity of the learner, but actually encourages, utilizes and rewards it as an integral part of the learning process (Wertsch 1997).

The importance of the background and culture of the learner

Social constructivisms or socioculturalism encourages the learner to arrive at his or her version of the truth, influenced by his or her background, culture or embeddedworldview. Historical developments and symbol systems, such as language, logic, and mathematical systems, are inherited by the learner as a member of a particular culture and these are learned throughout the learner's life. This also stresses the importance of the nature of the learner's social interaction with knowledgeable members of the society.

Responsibility for learning

Furthermore, it is argued that the responsibility of learning should reside increasingly with the learner (Glasersfeld, 1989). Social constructivism thus emphasizes the importance of the learner being actively involved in the learning process, unlike previous educational viewpoints where the responsibility rested with the instructor to teach and where the learner played a passive, receptive role.

The Harkness discussion method

It is called the "Harkness" discussion method because it was developed at Phillips Exeter Academy with funds donated in the 1930s by Edward Harkness. This is also named after the Harkness table and involves students seated in a circle, motivating and controlling their own discussion. The teacher acts as little as possible. Perhaps the teacher's only function is to observe, although he/she might begin or shift or even direct a discussion.

The motivation for learning

Another crucial assumption regarding the nature of the learner concerns the level and source of motivation for learning. According to Von Glasersfeld (1989) sustaining motivation to learn is strongly dependent on the learner's confidence in his or her potential for learning. These feelings of competence and belief in potential to solve new problems, are derived from first-hand experience of mastery of problems in the past and are much more powerful than any external acknowledgment and motivation (Prawat and Floden 1994).

The role of the instructor

Instructors as facilitators

According to the social constructivist approach, instructors have to adapt to the role of facilitators and not teachers (Bauersfeld, 1995). Whereas a teacher gives adidactic lecture that covers the subject matter, a facilitator helps the learner to get to his or her own understanding of the content.

A few strategies for cooperative learning include

7. Reciprocal Questioning: students work together to ask and answer questions
8. Jigsaw Classroom: students become "experts" on one part of a group project and teach it to the others in their group
9. Structured Controversies: Students work together to research a particular controversy (Woolfolk 2010)

The nature of the learning process

Learning is an active, social process

Social constructivism, strongly influenced by Vygotsky's (1978) work, suggests that knowledge is first constructed in a social context and is then appropriated by individuals (Bruning et al., 1999; M. Cole, 1991; Eggan & Kauchak, 2004). According to social constructivists, the process of sharing individual perspectives-calledcollaborative elaboration (Meter & Stevens, 2000)-results in learners constructing understanding together that wouldn't be possible alone (Greeno et al., 1996)[citation needed]

Dynamic interaction between task, instructor and learner

A further characteristic of the role of the facilitator in the social constructivist viewpoint, is that the instructor and the learners are equally involved in learning from each other as well (Holt and Willard-Holt

2000). This means that the learning experience is both subjective and objective and requires that the instructor's culture, values and background become an essential part of the interplay between learners and tasks in the shaping of meaning. Learners compare their version of the truth with that of the instructor and fellow learners to get to a new, socially tested version of truth (Kukla 2000).

Collaboration among learners

Learners with different skills and backgrounds should collaborate in tasks and discussions to arrive at a shared understanding of the truth in a specific field (Duffy and Jonassen 1992).

ACTIVITY-BASED LEARNING

Activity-based learning or ABL describes a range of pedagogical approaches to teaching. Its core premises include the requirement that learning should be based on doing some hands-on experiments and activities. The idea of activity-based learning is rooted in the common notion that children are active learners rather than passive recipients of information. If child is provided the opportunity to explore by their own and provided an optimum learning environment then the learning becomes joyful and long-lasting.

Characteristics

The key feature of the ABL method is that it uses child-friendly educational aids to foster self-learning and allows a child to study according to his/her aptitude and skill. Under the system, the curriculum is divided into small units, each a group of Self Learning
Materials (SLM) comprising attractively designed study cards or English,Tamil, maths, science and Social Science. When a child finishes a group of cards, he completes one "milestone". Activities in each milestone include games, rhymes, drawing, and songs to teach a letter or a word, form a sentence, do maths and science, or understand a concept. The child takes up an Exam Card only after completing all the milestones in a subject. If a child is absent one day, he/she continues from where he/she left unlike in the old system where the children had to learn on their own what they missed out on.

DISCOVERY LEARNING

Definition

Discovery learning is a technique of inquiry-based learning and is considered a constructivist based approach to education. It is supported by the work of learning theorists and psychologists Jean Piaget, Jerome Bruner, and Seymour Papert. Although this form of instruction has great popularity, there is some debate in the literature concerning its efficacy (Mayer, 2004).

Jerome Bruner is often credited with originating discovery learning in the 1960s, but his ideas are very similar to those of earlier writers (e.g. John Dewey). Bruner argues that "Practice in discovering for oneself teaches one to acquire information in a way that makes that information more readily viable in problem

solving" (Bruner, 1961, p. 26). This philosophy later became the discovery learning movement of the 1960s. The mantra of this philosophical movement suggests that we should 'learn by doing'. In 1991, The Grauer School, a private secondary school in Encinitas, California, was founded with the motto, "Learn by Discovery", and integrated a series of world-wide expeditions into their program for high school graduation. (See Expeditionary Learning.)

Discovery learning in practice

Typically, the educational goals of discovery learning include promoting a "deep" understanding; developing meta-cognitive skills; and encouraging a high level of student engagement. According to Nadira Saab, et al., discovery learning is a process of inductive inquiry where learners conducting experiments, a theory which closely resembles the scientific process. First, learners identify variables, collect data, and interpret data. Then learners generate hypotheses in order to better describe and understand relationships between concepts. Finally, the continuous cyclical process of learning requires learners to interpret the data, reject hypotheses, and make conclusions about information.

Similarly, Faye Borthick and Donald Jones suggest, "In discovery learning, participants learn to recognize a problem, characterize what a solution would look like, search for relevant information, develop a solution strategy, and execute the chosen strategy.

TYPES OF DISCOVERY LEARNING

- Experiments
- Exploration
- Simulation-based learning
- Problem-based learning
- Inquiry-based learning
- Web quests

Models of discovery learning

We should add a sort of common blueprint here maybe

1. Collaborative discovery learning
2. Discovery learning with microworlds
3. Experiental learning (to some extent)
4. Guided discovery learning
5. Incidental learning
6. Learning by exploring (exploratory learning)

7. Simulation-based learning
8. Case-based learning
9. Problem-based learning
10. inquiry-based learning

4 Technology

a. Cognitive tools
b. Simulations
c. Hypertext
d. Microworlds
e. A simple combination of webpages (read/write) and forums or alternatively a Wiki

Advantages and disavantages of discovery learning

Advantages

The discovery learning literature often claims the following advantages:

- Supports active engagement of the learner in the learning process
- Fosters curiosity
- Enables the development of life long learning skills
- Personalizes the learning experience
- Highly motivating as it allows individuals the opportunity to experiment and discover something for themselves
- Builds on learner's prior knowledge and understanding
- Develops a sense of independence and autonomy
- Make them responsible for their own mistakes and results
- Learning as most adults learn on the job and in real life situations
- A reason to record their procedure and discoveries - such as not repeating mistakes, a way to analyze what happened, and a way to record a victorious discovery
- Develops problem solving and creative skills
- Finds new and interesting avenues of information and learning - such as gravy made with too much cornstarch can become a molding medium

These sorts of arguments can be regrouped in two broad categories

- Development of meta cognitive skills (including some higher level cognitive strategies) useful in lifelong learning.

- Motivation

Disadvantages

Most researchers would argue that pure discovery learning as a general and global teaching strategy for beginning and intermediary learners doesn't work. The debate on how much guiding is needed is somewhat open. See Kirschner et al. (2006) for a good overview (or Mayer, 2004; Feldon) and also Merrill's first principles of instruction model that does promote unguided problem-based learning at the final stages of an instructional design.

Planning a Discovery Learning Experience

i. **select an activity**. To begin pick an activity that is relatively short so that follow-up attempts are easier to predict and plan for. Select a subject with which you are personally familiar and comfortable. Also in the beginning it is often best to choose an activity that does not have just one correct answer. Role-playing, creating sculptures, observing characteristics of objects, or searching for or classifying similar items all work well.

ii. **gather materials**. Remember to have enough materials for each learner to repeat the activity at least once.

iii. **stay focused**. Avoid learning tangents that may be interesting but will keep the learner from finishing the project, unless they are truly of great curiosity and value. Instead take notes concerning the new interest to follow-up on once the initial activity is completed.

iv. **use caution**. While the idea of discovery learning is for the instructor to step back and observe allowing the child to work independently, be sure that safety is observed. Activities such as cooking and cutting should always be supervised by an adult and experimenting with magnets is nice unless an important video or cassette tape is ruined.

v. **plan extra time**. Understand that children working on their own will most likely take longer than they would with an adult moving them from step to step. Also be sure to plan time for repeated activities in case there is a failure or other reason to repeat the activity.

vi. **record process and results**. Include in the activity a requirement for older children to record their procedure and results. For young children guide, assist, or model record keeping.

vii. **discuss and review**. After and activity is completed and before it is repeated a second time (if needed), discuss the activity and its outcome with the child. Use the records which were kept to assist during this step. Once the activity has been analyzed, record any observations or mistakes.

viii. **try again**. Have the child repeat the activity if necessary. Encourage her to take into account what was done and the discussion that occurred. Allow her to use any records that were kept to assist her in successfully completing the activity. Give assistance and guidance as necessary.

ix. **plan for more discovery learning activities**. Think over how this activity worked for the child. As you plan more discovery activities take the answers to these questions into consideration. What went well? What could have gone better? How can any problem areas be corrected or alleviated?

INFLUENCE OF METHODS ON ACTIVE ENGAGEMENT

Every passionate educator craves active engagement in the classroom. Whether you are a seasoned professor or a novice instructor, one of the biggest challenges you can be sure to face is how to get and keep your students engaged.

Finding ideas that guarantee engagement is often difficult because there is no one-size-fits-all model to engagement, especially when taking into account different modes of instruction and different course subjects. All instructors need go-to teaching strategies when attention seems to be waning.

Here are five proven approaches for active classroom engagement that work regardless of if you are teaching in-class or online. These are ideas that have been used in my own classrooms and compiled from colleagues teaching experiences across the globe.

1. Connect To You

Often the best way to reinforce ideas is to allow students to connect concepts explored in class to their own life experience or program of study. This works for general education electives but also for any course regardless of mode of delivery.

2. Create and Make

Creation leads to meaningful learning; when students make things it forces them to use their knowledge base as well as analyze and synthesize ideas. A student's creativity is one of your best untapped resources. Every student is creative in their own way.

3. Collaborate with Peers

When we were in Kindergarten our teachers used to say "sharing equals caring" and this same philosophy can help increase engagement in any class. The moment you ask students to share or collaborate they have to bring their collective knowledge to the table and fill in the gaps in order to communicate ideas and work as a team.

4. Blog, Journal, Discuss

Being able to reflect is important both for educators and for students. Taking the time to think about what has been discussed and to propose an intervention into the material is one way to get students engaged with the content and thinking about how everything fits together. Blogging or journaling (which is a low-tech way of achieving the same outcome) practices develop students' communication skills but also put ideas in relief in a way that engages latent literacy skills.

5. Go Social

There are many social media tools (some of them which have a low tech barrier) that you can integrate into your curriculum or active classroom in order to increase student engagement. Most of these social media tools can be used to help the students connect beyond the classroom environment and see how concepts and ideas work in the real world. Many instructors use Twitter in the active classroom and use hashtags as way to both push and pull information to and from the educational space.

6.Active Engagement in the Classroom Can Be Fun

By asking the students to respond to ideas in different ways, we can make active engagement in the classroom fun. Alternate between the strategies mentioned above so that in any 14-15 week course you are using each at least twice. Some can be used more often than others, depending on what works. Asking students to connect concepts to their own field of study is great reinforcing technique. Social media can function as an efficient way to summarize key points from each class or lecture every week. Creating something tangible in class, collaborating on a presentation or written piece, or asking students to blog or journal on an idea are strategies best spread out throughout the term so active engagement remains high.

Innovative methods of teaching are a goal of many educators. Teaching students in ways that keep them engaged and interested in the material can sometimes be a challenge. In the short-attention span world we live in, it can be harder than ever to keep high school students excited and engrossed in learning.

Innovative Teaching

Definition and Meaning

Innovative teaching is necessary for the present and future of education to help students to reach their full potential. Higher education should serve the long term intellectual needs of the student, for example, whether providing new material by teachers helped the student to gain new insights or opened up new channels of intellectual stimulation or enhanced student's essential and creative thinking power?. Innovative teaching is a necessity for all teachers in order to meet the educational needs of the new

generations. However, teachers' competency for innovative teaching is a key factor influencing innovative teaching performance. Some research points out that many teachers lack competencies for innovative teaching!

Visualization, technology tools and active learning

Finding new and innovative methods of teaching is a crucial skill for high school teachers. Brain research has shown that certain methods and approaches can truly enhance the learning process. Applying innovative learning and attention-management techniques to classes is a win-win for both students and teachers.

1. Visualization

A list of disconnected facts will not lead to a deep understanding in students or an integration of knowledge from one situation to another. Knowledge that is organized and connected to concepts with a goal of mastery, including the ability to visualize the concepts, can lead to the ability to transfer knowledge and lead to a deeper, longer-term understanding of what is taught.

Visualization is an especially good teaching strategy for reading and literacy teachers. Here's a lesson in how to use visualization to help students illustrate mental images from a portion of text that is read aloud:

Teaching students visualization skills help them understand, recall and think critically about subjects they study.

2. Wisely managed classroom technology

Computers, tablets, digital cameras, videoconferencing technology and GPS devices can enhance a student's learning experience. Possible uses of classroom technology include using video games to teach math and foreign languages, leveraging Skype to communicate with classrooms or guest speakers from around the world, or multimedia projects that allow students to explore subject matter using film, audio and even software they create.

However, tech devices in the high school classroom require teachers to add a component to their classroom management. Giving students laptops or tablets means teaching them to use devices respectfully and preventing damage to the equipment. Tech-savvy teachers gave Education Week the following advice on using classroom technology:

- Explain that the use of tech tools in class is a privilege not everyone has — and if abused, it can be discontinued.
- During class, teachers should move around the classroom or use monitoring software to ensure students are using their devices appropriately. When they understand that their teacher will intervene if they go off-task, students know they must focus on their assignment.

- Put students in charge of the upkeep of devices. Classes can learn tech terms, basic maintenance tasks, and appoint a few students to serve as tech monitors responsible for distributing and storing equipment. Doing this creates a sense of value and ownership for the welfare of classroom technology.

3. Active learning: Peer instruction, discussion groups and collaborative problem solving

All high school educators dread a roomful of blank faces or silence after they open up a topic for class discussion. According to the Johns Hopkins Center for Educational Resources (CER), devoting time to active learning projects is one way to get students thinking, talking and sharing information in the classroom. The CER publishes a series called the The Innovative Instructor that explores these methods.

The publication "Bring on the Collaboration!" describes a class structure where the instructor leads a short overview of the day's topic and gives students a challenge to meet by the end of the class, such as answering a question or solving a problem. Students break into small groups to do research online, chart out ideas and discuss ways to meet the challenge. Groups upload their work to a Blackboard site, where the teacher can review it. At the end of class, each group shares what they've learned with their peers.

Innovative methods of teaching can help high school students get the most out of their education. These are just three ideas for directions you can go in your quest for innovative learning for your students.

INQUIRY-BASED LEARNING

Inquiry-based learning (also **enquiry-based learning** in British English)[1] starts by posing questions, problems or scenarios—rather than simply presenting established facts or portraying a smooth path to knowledge. The process is often assisted by a facilitator. Inquirers will identify and research issues and questions to develop their knowledge or solutions. Inquiry-based learning includes problem-based learning, and is generally used in small scale investigations and projects, as well as research.[2] The inquiry-based instruction is principally very closely related to the thinking and its development.

- Creating questions of their own
- Obtaining supporting evidence to answer the question(s)
- Explaining the evidence collected
- Connecting the explanation to the knowledge obtained from the investigative process
- Creating an argument and justification for the explanation

Inquiry learning involves developing questions, making observations, doing research to find out what information is already recorded, developing methods for experiments, developing instruments for data

collection, collecting, analyzing, and interpreting data, outlining possible explanations and creating predictions for future study.

BLENDED LEARNING

Definition

Blended learning is a formal education program in which a student learns at least in part through delivery of content and instruction via digital and online media with some element of student control over time, place, path, or pace.[1][2][3] While still attending a "brick-and-mortar" school structure, face-to-face classroom methods are combined with computer-mediated activities.[4] Blended learning is also used in professional development and training settings, as it can be used to translate knowledge into a particular skill that is useful and practical for a specific job. A lack of consensus on a definition of blended learning has led to difficulties in research about its effectiveness in the classroom.

Models

Although there is little consensus on the definition of blended learning and some academic studies have suggested it is a redundant term,[13] there are distinct blended learning models that have been suggested by some researchers and educational think tanks.

Blended learning can generally be classified into six models:[14]

1. Face-to-face driver – where the teacher drives the instruction and augments with digital tools.
2. Rotation – students cycle through a schedule of independent online study and face-to-face classroom time.
3. Flex – Most of the curriculum is delivered via a digital platform and teachers are available for face-to-face consultation and support.
4. Labs – All of the curriculum is delivered via a digital platform but in a consistent physical location. Students usually take traditional classes in this model as well.
5. Self-blend – Students choose to augment their traditional learning with online course work.
6. Online driver – Students complete an entire course through an online platform with possible teacher check-ins. All curriculum and teaching is delivered via a digital platform and face-to-face meetings are scheduled or made available if necessary.

PEER LEARNING

One of the most visible approaches to **peer learning** comes out of cognitive psychology, and is applied within a "mainstream" educational framework: "Peer learning is an educational practice in which students

interact with other students to attain educational goals."[1] In this context, it can be compared to the practices that go by the name cooperative learning. However, other contemporary views on peer learning relax the constraints, and position "**peer-to-peer learning**" as a mode of "learning for everyone, by everyone, about almost anything." Whether it takes place in a formal or informal learning context, in small groups or online, peer learning manifests aspects of self-organization that are mostly absent from pedagogical models of teaching and learning

Applications

In the forward to a book on the Power of peer learning by Jean-H. Guilmette, Maureen O'Neil, then president of Canada's International Development Research Centre, states that

Our experience has proven that [peer learning] is an efficient way to transmit knowledge across a wide range of groups or regions. Peer learning, based on jointly generated evidence, is also an effective means to build capacity and foster scientific excellence. The body of knowledge it generates is a powerful tool for the development of evidence-based policy.

Guilmette suggests that peer learning is useful in the development context because

It is my view that managing networks, especially those that are made up of sovereign nations, is fundamentally different from managing companies, organizations, or ministries that fall under a single authority. In essence, the dominant management approach for companies and institutions rests on cybernetics, with the view of keeping communications and accountability simple and clear. Managing methods that are successful in such a context [are] counterproductive when managing networks.

Guilmette cites Anne K. Bernard, who in a report based on extensive interviews, concludes:

Effective networks act not simply on the basis of optimizing within constraints by attempting to force-fit predicted, linear and regulated programmes of work onto dynamic policy and client communities. Rather, they hone capacities and create mechanisms for the regular feedback and reflected analyses which are needed to deal with the ambiguity of these environments, and to adapt interactively with them.

Mind Map

Definition

A **mind map** is a diagram used to visually organize information. A mind map is often created around a single concept, drawn as an image in the center of a blank page, to which associated representations of ideas such as images, words and parts of words are added. Major ideas are connected directly to the central concept, and other ideas branch out from those.

Mind maps can be drawn by hand, either as "rough notes" during a lecture, meeting or planning session, for example, or as higher quality pictures when more time is available.

Mind maps are considered to be a type of spider diagram. A similar concept in the 1970s was "idea sun bursting".

USES

As with other diagramming tools, mind maps can be used to generate, visualize, structure, and classify ideas, and as an aid to studying and organizing information, solving problems, making decisions, and writing.

Mind maps have many applications in personal, family, educational, and business situations, including notetaking, brainstorming (wherein ideas are inserted into the map radially around the center node, without the implicit prioritization that comes from hierarchy or sequential arrangements, and wherein grouping and organizing is reserved for later stages), summarizing, as amnemonic technique, or to sort out a complicated idea. Mind maps are also promoted as a way to collaborate in color pen creativity sessions.

In addition to these direct use cases, data retrieved from mind maps can be used to enhance several other applications; for instance expert search systems, search engines and search and tag query recommender. To do so, mind maps can be analysed with classic methods of information retrieval to classify a mind map's author or documents that are linked from within the mind map

Mind mapping is one of the best ways to capture your thoughts and bring them to life in visual form. Beyond just note-taking, though, mind maps can help you become more creative, remember more, and solve problems more effectively. Whether you're new to mind maps or just want a refresher, here's all you need to know about this technique.

Mind maps can be more effective than other brainstorming and linear note-taking methods for a number of reasons:

6. It's a graphical tool that can incorporate words, images, numbers, and color, so it can be more memorable and enjoyable to create and review. The combination of words and pictures is six times better for remembering information than words alone.
7. Mind maps link and group concepts together through natural associations. This helps generate more ideas, find deeper meaning in your subject, and also prompt you to fill in more or find what you're missing.
8. A mind map can at once give you an overview of a large subject while also holding large amounts of information.
9. It's also a very intuitive way to organize your thoughts, since mind maps mimic the way our brains think—bouncing ideas off of each other, rather than thinking linearly.

10. You can generate ideas very quickly with this technique and are encouraged to explore different creative pathways.

COLLABORATIVE LEARNING

Definition

Collaborative learning is a situation in which two or more people learn or attempt to learn something together. Unlike individual learning, people engaged in collaborative learning capitalize on one another's resources and skills (asking one another for information, evaluating one another's ideas, monitoring one another's work, etc.). More specifically, collaborative learning is based on the model that knowledge can be created within a population where members actively interact by sharing experiences and take on asymmetry roles. Put differently, collaborative learning refers to methodologies and environments in which learners engage in a common task where each individual depends on and is accountable to each other. These include both face-to-face conversations and computer discussions (online forums, chat rooms, etc.). Methods for examining collaborative learning processes include conversation analysis and statistical discourse analysis.

Thus, collaborative learning is commonly illustrated when groups of students work together to search for understanding, meaning, or solutions or to create an artifact or product of their learning. Further, collaborative learning redefines traditional student-teacher relationship in the classroom which results in controversy over whether this paradigm is more beneficial than harmful. Collaborative learning activities can include collaborative writing, group projects, joint problem solving, debates, study teams, and other activities. The approach is closely related to cooperative learning.

Computer-supported collaborative learning (CSCL) is a pedagogical approach wherein learning takes place via social interaction using a computer or through the Internet. This kind of learning is characterized by the sharing and construction of knowledge among participants using technology as their primary means of communication or as a common resource. CSCL can be implemented in online and classroom learning environments and can take place synchronously or asynchronously.

The study of computer-supported collaborative learning draws on a number of academic disciplines, including instructional technology, educational psychology, sociology, cognitive psychology, and social psychology. It is related to collaborative learning and computer supported cooperative work (CSCW).

NEW TRENDS IN LEARNING USE OF COMPUTER

- **Mobile Learning**. New advances in hardware and software are making mobile "smart phones" indispensible tools. Just as cell phones have leapfrogged fixed line technology in the telecommunications industry, it is likely that mobile devices with internet access and computing

capabilities will soon overtake personal computers as the information appliance of choice in the classroom.

- **Cloud computing**. Applications are increasingly moving off of the stand alone desk top computer and increasingly onto server farms accessible through the Internet. The implications of this trend for education systems are huge; they will make cheaper information appliances available which do not require the processing power or size of the PC. The challenge will be providing the ubiquitous connectivity to access information sitting in the "cloud".

- **One-to-One computing**. The trend in classrooms around the world is to provide an information appliance to every learner and create learning environments that assume universal access to the technology. Whether the hardware involved is one laptop per child (OLPC), or – increasingly -- a net computer, smart phone, or the re-emergence of the tablet, classrooms should prepare for the universal availability of personal learning devices.

- **Ubiquitous learning**. With the emergence of increasingly robust connectivity infrastructure and cheaper computers, school systems around the world are developing the ability to provide learning opportunities to students "anytime, anywhere". This trend requires a rethinking of the traditional 40 minute lesson. In addition to hardware and Internet access, it requires the availability of virtual mentors or teachers, and/or opportunities for peer to peer and self-paced, deeper learning.

- **Gaming**. A recent survey by the Pew Internet and American Life Project per the Horizon Report found that massively multiplayer and other online game experience is extremely common among young people and that games offer an opportunity for increased social interaction and civic engagement among youth. The phenomenal success of games with a focus on active participation, built in incentives and interaction suggests that current educational methods are not falling short and that educational games could more effectively attract the interest and attention of learners.

- **Personalized learning**. Education systems are increasingly investigating the use of technology to better understand a student's knowledge base from prior learning and to tailor teaching to both address learning gaps as well as learning styles. This focus transforms a classroom from one that teaches to the middle to one that adjusts content and pedagogy based on individual student needs – both strong and weak.

- **Redefinition of learning spaces**. The ordered classroom of 30 desks in rows of 5 may quickly become a relic of the industrial age as schools around the world are re-thinking the most appropriate learning environments to foster collaborative, cross-disciplinary, students centered learning. Concepts such as greater use of light, colors, circular tables, individual spaces for students and teachers, and smaller open learning spaces for project-based learning are increasingly emphasized.

- **Teacher-generated open content**. OECD school systems are increasingly empowering teachers and networks of teachers to both identify and create the learning resources that they find most effective in the classroom. Many online texts allow teachers to edit, add to, or otherwise customize material for their own purposes, so that their students receive a tailored copy that exactly suits the style and pace of the course. These resources in many cases complement the official textbook and may, in the years to come, supplant the textbook as the primary learning source for students. Such activities often challenge traditional notions of intellectual property and copyright.

- **Smart portfolio assessment**. The collection, management, sorting, and retrieving of data related to learning will help teachers to better understand learning gaps and customize content and pedagogical approaches. Also, assessment is increasingly moving toward frequent formative assessments which lend itself to real-time data and less on high-pressure exams as the mark of excellence. Tools are increasingly available to students to gather their work together in a kind of online portfolio; whenever they add a tweet, blog post, or photo to any online service, it will appear in their personal portfolio which can be both peer and teacher assessed.

- **Teacher managers/mentors**. The role of the teacher in the classroom is being transformed from that of the font of knowledge to an instructional manager helping to guide students through individualized learning pathways, identifying relevant learning resources, creating collaborative learning opportunities, and providing insight and support both during formal class time and outside of the designated 40 minute instruction period. This shift is easier said than done and ultimately the success or failure of technology projects in the classroom hinge on the human factor and the willingness of a teacher to step into unchartered territory.