UNIT – VIII: APPROACHES TO TEACHING

Unit 8: Approaches to Teaching : *Various Approaches to Teaching, such as, Behaviourist, Cognitivist, Constructivist, Connectionist, Participatory, Cooperative, Personalized, Wholistic*

VARIOUS APPROACHES TO TEACHING

CONSTRUCTIVIST

Constructivism is a philosophical viewpoint about the nature of knowing. Specifically, it represents an epistemological stance. There are many "flavors" of constructivism, but one prominent theorist known for his constructivist views is Jean Piaget. Piaget focused on how humans make meaning in relation to the interaction between their experiences and their ideas. He considered himself to be a genetic epistemologist, which means he considered this interaction in relation to how humans are set up by their genetic make up to develop intellectually. His views tended to focus on human development in relation to what is occurring with an individual as opposed to development as influenced by other humans. Views that focuses more on human development in the context of the social world are also of many flavors and include the sociocultural or socio-historical perspective of Lev Vygotsky, and the situated cognition perspectives of Jean Lave and Etienne Wenger; Brown, Collins and Duguid; Newman, Griffin, and Cole and Barbara Rogoff. The concept of constructivism has influenced a number of disciplines, including psychology, sociology, education and the history of science. During its infancy, constructivism examined the interaction between human experiences and their reflexes or behavior-patterns. Jean Piaget called these systems of knowledge *schemes*. These are not to be confused with "schema," a term that comes from schema theory, which is comes from information-processing perspectives on human cognition. Whereas Piaget's schemes are content free, schemata (the plural of schema) in schema theory are concepts. For example, most humans have a schema for "grandmother" or "egg" or "magnet." Constructivism does not refer to a specific pedagogy, although it is often confused with constructionism, an educational theory developed by Seymour Papert, inspired by constructivist and experiential learning ideas of Piaget. 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.[*citation needed*]

Constructivist Learning approach

Introduction

The latest catchword in educational circles is "constructivism, " applied both to learning theory and to epistemology---both to how people learn, and to the nature of knowledge.[1,2] We don't need to succumb to each new fad, but we do need to think about our work in relation to theories of learning and knowledge. So we need to ask: what is constructivism, what does it have to tell us that is new and relevant, and how do we apply it to our work? As far as I can see, there is nothing dramatically new in constructivism: the core ideas expressed by it have been clearly enunciated by John Dewey among others, but there is a new, widespread acceptance of this old set of ideas. and new research in cognitive psychology to support it. I would like to give a brief exposition of ideas central to constructivism and widely accepted today by educators. curriculum developers and cognitive psychologists, and then suggest what they mean for museum educators.

Constructivism

What is meant by constructivism?

The term refers to the idea that learners construct knowledge for themselves---each learner individually (and socially) constructs meaning---as he or she learns. Constructing meaning is learning; there is no other kind. The dramatic consequences of this view are twofold;

1) we have to focus on the learner in thinking about learning (not on the subject/lesson to be taught):

2) There is no knowledge independent of the meaning attributed to experience (constructed) by the learner, or community of learners.

Let me discuss the second point first because, although it appears radical on an everyday level, it is a position which has been frequently adopted ever since people began to ponder epistemology. If we accept constructivist theory (which means we are willing to follow in the path of Dewey, Piaget and Vigotsky among others), then we have to give up Platonic and all subsequent realistic views of epistemology. We have to recognize that there is no such thing as knowledge "out there" independent of the knower, but only knowledge we construct for ourselves as we learn. [4] Learning is not understanding the "true" nature of things, nor is it (as Plato suggested) remembering dimly perceived perfect ideas, but rather a personal and social construction of meaning out of the bewildering array of sensations which have no order or structure besides the explanations (and I stress the plural) which we fabricate for them.

Principles of learning

What are some guiding principles of constructivist thinking that we must keep in mind when we consider our role as educators? I will outline a few ideas, all predicated on the belief that learning consists of individuals' constructed meanings and then indicate how they influence museum education.

1. **Learning is an active process** in which the learner uses sensory input and constructs meaning out of it. The more traditional formulation of this idea involves the terminology of the active learner (Dewey's term) stressing that the learner needs to do something; that learning is not the passive acceptance of knowledge which exists "out there" but that learning involves the learner s engaging with the world.

2. **People learn to learn as they learn:** learning consists both of constructing meaning and constructing systems of meaning. For example, if we learn the chronology of dates of a series of historical events, we are simultaneously learning the meaning of a chronology. Each meaning we construct makes us better able to give meaning to other sensations which can fit a similar pattern.

3. **The crucial action of constructing meaning is mental:** it happens in the mind. Physical actions, hands-on experience may be necessary for learning, especially for children, but it is not sufficient; we need to provide activities which engage the mind as well as the hands (Dewey called this reflective activity.)

4. **Learning involves language:** the language we use influences learning. On the empirical level. researchers have noted that people talk to themselves as they learn. On a more general level. there is a

collection of arguments, presented most forcefully by Vigotsky, that language and learning are inextricably intertwined. This point was clearly emphasized in Elaine Gurain's reference to the need to honor native language in developing North American exhibits. The desire to have material and programs in their own language was an important request by many members of various Native American communities.

5. Learning is a social activity: our learning is intimately associated with our connection with other human beings, our teachers, our peers, our family as well as casual acquaintances, including the people before us or next to us at the exhibit. We are more likely to be successful in our efforts to educate if we recognize this principle rather than try to avoid it. Much of traditional education, as Dewey pointed out, is directed towards isolating the learner from all social interaction, and towards seeing education as a one-on-one relationship between the learner and the objective material to be learned. In contrast, progressive education (to continue to use Dewey's formulation) recognizes the social aspect of learning and uses conversation, interaction with others, and the application of knowledge as an integral aspect of learning.

6. Learning is contextual: we do not learn isolated facts and theories in some abstract ethereal land of the mind separate from the rest of our lives: we learn in relationship to what else we know, what we believe, our prejudices and our fears. On reflection, it becomes clear that this point is actually a corollary of the idea that learning is active and social. We cannot divorce our learning from our lives.

7. One needs knowledge to learn: it is not possible to assimilate new knowledge without having some structure developed from previous knowledge to build on. The more we know, the more we can learn. Therefore any effort to teach must be connected to the state of the learner, must provide a path into the subject for the learner based on that learner's previous knowledge.

8. It takes time to learn: learning is not instantaneous. For significant learning we need to revisit ideas, ponder them try them out, play with them and use them. This cannot happen in the 5-10 minutes usually spent in a gallery (and certainly not in the few seconds usually spent contemplating a single museum object.) If you reflect on anything you have learned, you soon realize that it is the product of repeated exposure and thought. Even, or especially, moments of profound insight, can be traced back to longer periods of preparation.

9. Motivation is a key component in learning. Not only is it the case that motivation helps learning, it is essential for learning. This ideas of motivation as described here is broadly conceived to include an understanding of ways in which the knowledge can be used. Unless we know "the reasons why", we may not be very involved in using the knowledge that may be instilled in us. even by the most severe and direct teaching.

The meaning of constructivism for museums

Having suggested these principles, I want to reflect on what they may mean for our specific day- to-day work both in mounting exhibits and in developing educational programs.

1. Most museum educators have accepted the idea that learners need to be active, that in order to participate in learning we need to engage the learner in doing something, in hands-on involvement, in participatory exhibits and programs. But the more important point, I believe, is the idea that the actions which we develop for our audience engage the mind as well as the hand. Not all experiences are educative, as Dewey pointed out in *Experience and Education*. This does not mean that they necessarily have to be complex---but they do need to allow the participants to think as they act. I recently saw a videotape of a group of children building a cardboard ramp which would serve as an inclined plane for an experiment they were to do. What the video tape showed was a fifteen-minute period in which the children spent time measuring, constructing (and wandering around) with little idea of what they were building or why they were building it. It was a hands-on activity that was not likely to be educative as intended for two reasons: a) The children had no chance to incorporate what they were doing into a larger picture: the focus was on completing a task, which for them must have appeared to be just one more of the senseless requirements of school. b) There was no opportunity to alter the task to fit the meaning-making of any individual student. They all simply measured strips of paper 24 inches long (the US is still not on the metric system) and 1.5" wide, everyone following the same recipe with no variation.

2. The idea that we learn to learn as we learn, that we begin to understand organizing principles as we use them, is not terribly radical to most of us, but I believe that there is an important manner of formulating it that can help us, which sometimes eludes us: What are we assuming about our visitors' ability to learn (to organize knowledge) when we present exhibits to them? What organizing schemes do we attribute to them, that may or may not be available to them? Let me give you an example. During the last year we have been observing visitors at the Boston Museum of Science interacting with a series of exhibits developed originally at the Exploratorium in San Francisco. We asked them what they thought of the exhibits. Some visitors did not have the tools they needed to get the concept of the exhibit. I don't mean that they did not understand the concept (that will be my next point) but that they did not have the organizing principles, and thus the learning tools.

Learning is a social activity.

To what extent do we recognize that people learn as they speak and interact with each other? In evaluating an interactive exhibit at the Boston Museum of Science in which people could get information through a variety of modalities---they could read labels, listen to tapes, smell animal smells, touch animal mounts and manipulate interactive exhibit components-- -we noted that individual visitors preferred different learning modes. In family groups, the conversations became more democratic, and involved more members after all these modalities were installed, as family members shared, discussed and confirmed what each had learned while perusing his or her preferred modality.

This is really an elaboration of the point made previously about learning to learn as one learns.

Our visitors need "hooks"---connections---in exhibits to help them understand the messages intended. An experienced museum-goer or a person knowledgeable on a given subject can be enlightened easily. But what does it mean for a naive visitor to be confronted with a whole case containing may objects? Of what value is it to the naive visitor to be invited to push this button or read a sophisticated label?

It is important for exhibits to provide different kinds of entry points, using various sensory modes, different kinds of stimuli, to attract a wide range of learners. In teaching people to read, the use of different words which have powerful connections for individuals was dramatically described years ago by Sylvia Ashton-Warner and widely emulated since. Eurydice Retsila described a program in which children served as young ethnographers, developing individual projects of interest to them with the "assistance" of university students.

Perhaps no other issue in constructivism raises more questions than the concern with finding the right level at which to engage the learner.

Vigotsky spoke of the "zone of proximal development," an unfortunately cumbersome term which refers to a level of understanding that is possible when a learner engages in a task with the help of a more expert peer (i.e. a teacher). People learn as they are stretched beyond their own knowledge but only within a range that is within their grasp given what knowledge and skills they bring to a task.

Finally there is the issue of time to learn, time to reflect and time to revisit an idea.

Museum educators have grappled with this problem and find it a particularly challenging one, since our audiences are free to come and go, and large fractions of them are tourists who many never return. Museum galleries are not designed as places to linger, despite our desire to have visitors spend more time there. I was impressed to note in the slide Michael Cassin showed yesterday that the National Gallery at the turn of the century had many chairs scattered around the gallery for people to sit in and contemplate the pictures. What do we do for the visitors who wish to stay with a topic longer? How have we organized our museums to accommodate them? To what extent have we provided additional resources (in addition to items which we are eager to sell to them in the nearby shop) that can satisfy the interested visitors' concerns that arise on the next day or a week after the visit?

Conclusion

The principles of constructivism, increasingly influential in the organization of classrooms and curricula in schools, can be applied to learning in museums. The principles appeal to our modern views of learning and knowledge but conflict with traditional museum practices. We need to reflect on our practice in order to apply these ideas to our work.

CONNECTIONIST APPROACH

onnectionism is a set of approaches in the fields of artificial intelligence, cognitive psychology, cognitive science, neuroscience, and philosophy of mind, that
models mental or behavioral phenomena as the emergent pocesses of *interconnected networks of simple units*. The term was introduced by Donald Hebb in 1940s. There are many forms of connectionism, but the most common forms use neural network models.

BASIC PRINCIPLE

The central connectionist principle is that mental phenomena can be described by interconnected networks of simple and often uniform units. The form of the connections and the units can vary from model to model. For example, units in the network could represent neurons and the connections could represent synapses like in the brain of a human being.

Learning

The weights in a neural network are adjusted according to some learning rule or algorithm, such as Hebbian learning. Thus, connectionists have created many sophisticated learning procedures for neural networks. Learning always involves modifying the connection weights. In general, these involve mathematical formulas to determine the change in weights when given sets of data consisting of activation vectors for some subset of the neural units.

By formalizing learning in such a way, connectionists have many tools. A very common strategy in connectionist learning methods is to incorporate gradient descentover an error surface in a space defined by the weight matrix. All gradient descent learning in connectionist models involves changing each weight by the partial derivative of the error surface with respect to the weight. Backpropagation (BP), first made popular in the 1980s, is probably the most commonly known connectionist gradient descent algorithm today.

The Connectionist Approach

Connectionist artificial neural networks are an approach to neural computing which uses interconnected simple processors, called *neurons* to form a simplified model of the structures in the biological nervous system.

These neural networks have the ability to learn from examples and are trained to solve problems rather than programmed. The network has the ability to adapt to the environment.

The connectionist approach is very much inspired by biology and psychology. The very beginning of this field can be seen in the works of McCulloch and Pitts ([mccu43]), Hebb ([hebb49]), and Rosenblatt

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([rose58]). This research does introduce the idea of parallel and interconnected neural systems based on simple units.

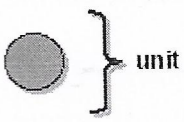
However there are various limitations to single layer networks which consist of simple neurons. These limitations, especially the classification problem of sets that are not linearly separable (in particular the XOR-Problem) were studied by Minsky and Papert ([mins69]). The publication of these results saw a significant reduction in research in neural networks.

Connectionism is the name for the computer modeling approach to information processing based on the design or architecture of the brain. Not the architecture of the*whole* brain mind you. Rather, because neurons are the basic information processing structures in the brain, and every sort of information the brain processes occurs in networks of interconnected neurons (neural networks), connectionist computer models are based on how computation occurs in neural networks.

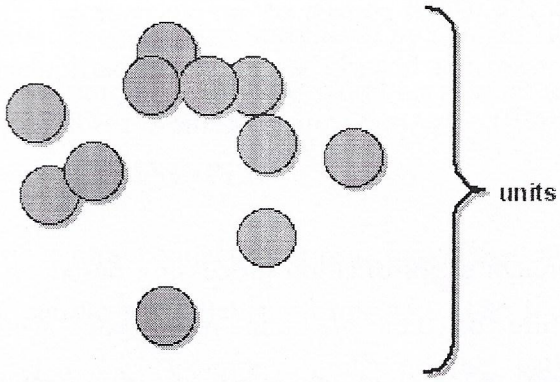
There are many kinds of connectionist computer models -- connectionist networks. Some are designed for tasks that have nothing to do with modeling biological neurons. Other models *are* offered as a way to understand how "real" neural networks work. These models are called artificial neural networks. For now, we do not need to worry about whether a particular connectionst model is merely a connectionst network or if it is an artificial neural network. The reason for this is that *all* connectionst models consist of four parts -- units, activations, connections, and connection weights. Each of these parts corresponds to a particular structure or process in biological neural networks. To see this, let's first take a look at the anatomy of a connectionst model. Then let's take a look at how such models work.

Anatomy of a connectionst model

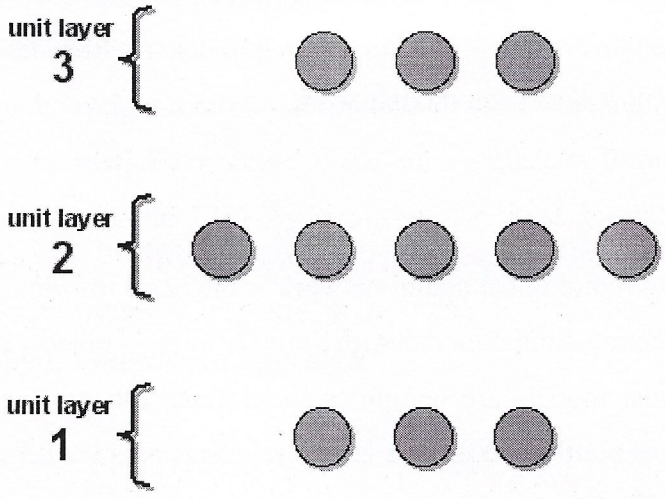
Units are to a connectionist model what neurons are to a biological neural network -- the basic information processing structures. While it is possible to build a connectionist model with *tangible* units -- objects that can be touched as well as seen -- most connectionist models are computer simulations run on digital computers. Units in such models are *virtual* objects, as are the pieces in a computer chess game. And just as you need symbols for the pieces in order to follow a virtual chess game, the "pieces" in a connectionist computer model need to be represented in some fashion too. Units are usually represented by circles. Here is a unit.



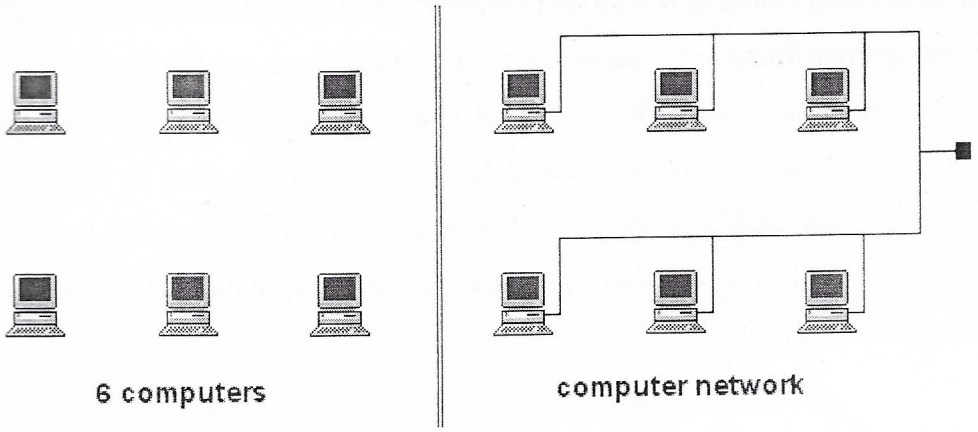
Because no unit by itself constitutes a network, connectionist models typically are composed of many units (or at least several of them). Here are 11 units:



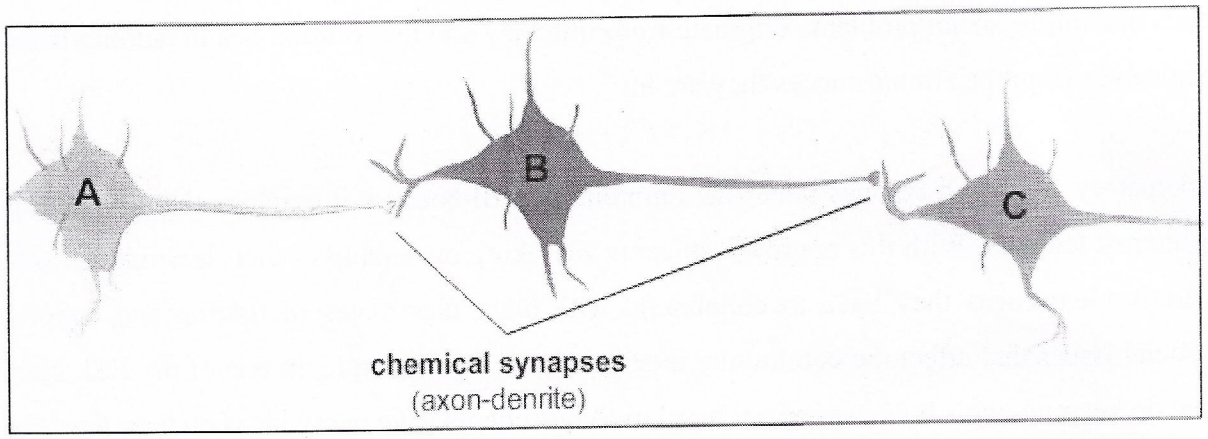
But no mere cluster of units constitutes a network either. And you will never see a connectionist model "organized" in this chaotic fashion. After all, not just *any* grouping of units corresponds to the architecture of biological neural networks. "Real" neural networks are organized in layers of neurons. For this reason, connectionist models are organized in layers of units, not random clusters. In most connectionst models, units are organized in 3 layers. (Incidentally, the cerebral cortex, the convoluted outer part of the brain, is organized into 6 layers.) So, reorganized in 3 layers of units, the following organization of units mirrors the structural organization of many connectionist models.



But what you see here *still* isn't a network. Something is missing. Can you tell what that "something" is? For a hint, take a look at the pair of images below. The one on the left does not capture a computer network. The one on the right does. *What makes the image on the left an image of 6 computers, but the one on the right an image of a computer network?*



The *connections*! The computers on the right are *connected* to one another. Because no group of objects qualifies as a network unless each member is *connected* to other members, it is the existence of *connections* between the 6 computers on the right that makes them a computer network.



The synapses! Synapses are to neural networks what an ethernet cable or telephone wire is to a computer network -- conduits through which information flows from one member of the network to the next. Without synapses (connections) *from* other neurons, it would be impossible for a neuron to receive INPUT from other neurons. And without synapses (connections) *to* other neurons, it would be impossible for a neuron to send OUTPUT to other neurons. Given the crucial role connections play in a network of neurons, synapses (connections) in a biological neural network matter as much as the neurons themselves. And because connectionist models are based on how computation occurs in biological neural networks, connections play an essential role in connectionist models -- hence the name "connectionism."

PARTICIPATORY APPROACH

Participatory approach, also known as Freirean Approach, is a teaching strategy that incorporates themes or content area that are of interest to the learners. Freire contends that unjust social circumstances originate from illiteracy and the reason for seeking education is to empower learners to take a proactive stance in liberating themselves from their burdens (Spencer 1992). The Participatory approach is under the umbrella

of Content-Based Instruction (CBI) in that it uses topics for specific purposes. The themes derive from real issues that affect students' daily lives where language learning is used as a vehicle to solve social problems. There are various activities that can be incorporated in this teaching strategy which aim to develop all language domains in the learning process. According to Auerbach (as cited in Ross, 1995), learners are also encouraged to take ownership of their learning as well as collaborate with the teacher, including participating in small and whole group activities for learning to be meaningful. However, in the participatory approach meaning precedes form.

The Participatory Approach is a brainchild of Brazilian language educator Paulo Freire (Check out Paulo Freire's personal interview at the end of this page) . Freire is the author of the book "Pedagogy of the Oppressed". Many researchers have also referred to this method as the Freirean Approach to language literacy education. The goal of this method is to use language learning as a tool to provide solutions to social problems that impact learners in their daily lives. According to Jurno (as cited in Spencer, 1992) Freire contends that unjust social problems originate from illiteracy and the solution lies in helping learners empower themselves from the circumstances they are in.

The Participatory Approach belongs under the umbrella of CBI because it employs themes and topics that affect orinterest learners. With this approach students are taking ownership of their learning as well as adding cooperative learningas they have to collaborate with other classmates in finding and endorsing solutions to social issues that affect the community they belong to. For example, in one of my ESL classes I chose a topic on keeping one's home safe from burglars. My students gave many ideas on how they could keep their household safe. In this lesson they learned vocabulary items that were specific to the theme; words such as burglar, cat prowler, etc. These vocabulary items enrich their learning. We built on these vocabulary items by using them in sentences both in writing and in speaking exercises. Students also exercised their reading skills by reading specific materials.

Classroom application

A classroom using a participatory approach is different from many teacher-fronted classrooms that have been typical in language learning setting. Participatory approach, through the concept of Freire, opposes the old "banking method" of teaching where the teacher acts as depositor of information and students act as recipients. Unlike the preceding methods, participatory approach utilizes a two-way transaction of learning. In this method, the teacher and students collaborate with each other with the teacher acting as a guide and facilitator. Over the course of the lessons, teachers in participatory approach eventually turn over some facets of control to the students. The topics are generated based from students' realities and previous experience which make up for an authentic and meaningful learning experience.

Topics such as providing safety for women and suggesting better solutions to personal struggles and community problems are discussed allowing students to participate by expressing themselves.

Participatory approaches to learning are active approaches that encourage people to think for themselves. Participants actively contribute to teaching and learning, rather than passively receiving information from outside experts, who may not have local understanding of the issues. The approach encourages people to share information, learn from each other, and work together to solve common problems.

As people become more experienced with the approach, they take increasing responsibility for planning their own learning sessions. They learn how to work together in a group. They also gain experience in using the activities and visual tools to do their own fieldwork.

Participants can bring what they have learned back to their own organisations and communities, and continue to use facilitator techniques and participatory tools locally. Participatory learning also ultimately provides people with a framework of skills that they can use in any situation to explore issues and take action.

USES OF PARTICIPATORY APPROACHES

Participatory approaches are used in situations where a number of people must work together to resolve a common problem.

Good problem solving requires input from a variety of people with many types of experience and expertise. It also includes everyone who is interested in finding the best solution —the stakeholders. Experience shows that when everyone contributes to the learning process, then people feel more ownership of the problem and develop more appropriate solutions for their context.

HIV/AIDS is an issue that often involves the whole community. It requires that people from international, national, regional and local organisations work together. Participatory workshops can be very effective in bringing people together, from members of local communities to national NGOs and international policy-makers.

When people at international, national and regional levels have the opportunity to learn and to work together, there can be better co-ordination of services.

The workshops can raise awareness of HIV/AIDS, as well as developing knowledge, skills and attitudes relating to HIV/AIDS. However, participatory approaches have disadvantages

as well as advantages.

ADVANTAGES AND DISADVANTAGES OF PARTICIPATORY APPROACHES TO LEARNING

Advantages

- They use inexpensive resources.
- They can be used in any physical setting.
- They are interesting and fun—helping to involve people in the subject.
- They help people to build self-confidence.
- They help people to learn about themselves.
- They help people to understand the perspectives of others.
- Participants with different degrees of experience and literacy can use them.
- They prevent individuals from being singled out for what they know, or don't know.
- They are less intimidating for less confident participants.
- They can help people to analyse complex situations.
- Outcomes are often documented during the process and do not depend on jargon.
- They are memorable.
- Lessons learnt can be brought back to local communities or organisations.

Disadvantages

- They are difficult to plan, because planning often depends on what the participants want to do.
- Involving stakeholders takes time.
- It can take time for people who are used to being "students" rather than "participants" to feel comfortable with these approaches.
- Facilitator techniques can be difficult to master and use effectively.
- They can make people feel uncomfortable, for example about drawing.
- They can be difficult to document in a report format but can be documented well using photographs or by keeping flipcharts.
- Some people may not consider them to be valid ways of working.
- Participants may be more focused on the creative, rather than learning, aspect of the activity.

- It can be difficult to establish clear action points or conclusions from the activity.

Cooperative approach

There are many benefits from using Cooperative Learning. Students will appreciate the value of teamwork and make a positive contribution when working with others to solve problems and complete tasks. Students learn research skills more readily when skills are shared through cooperative learning. Cooperative Learning allows students to enhance their ability to manage ideas and information in collaboration with others.

Cooperative Learning allows students to observe, imitate, and learn from each other. Students keep each other on task and share a sense of accomplishment. The encouragement, support, and approval of peers build motivation and make learning an enjoyable experience. In addition, with advances in technology and changes in the workforce infrastructure, the teamwork and cooperation learned through Cooperative Learning activities is of high value for the future success for the students.

Cooperative Learning should include five essentials:

1. ***Positive Interdependence***

   Students realize that each individual affects the work and success of the others. The work is structured so that students must share information in order to complete their cooperative tasks.

2. ***Student-to-Student Interaction***

   The teacher openly encourages students to help each other. Students share resources with each other, provide constructive feedback, challenge other members' reasoning and ideas, keep an open mind, act in a trustworthy way, and promote a safe feeling for all by reducing anxiety.

3. ***Individual Accountability***

   Even though students work together, they also perform independently. Each individual's performance is assessed. Students must take personal responsibility for working toward the group goal(s).

4. *Social Skills*

   Students learn and use appropriate social skills that include leadership, decision-making, trust building, communication, and conflict-management.

5. *Group Process*

   To better develop the group process, students must analyze how well they are achieving their goals while maintaining effective working relationships.

What are some Cooperative Learning Approaches?

To be successful, Cooperative Learning tasks are designed by teachers so that students are required to depend on one another to complete the assigned tasks and to master content and skills. There are many Cooperative Learning approaches that are designed to achieve different objectives. When these approaches are used frequently and correctly, students will acquire the positive results of Cooperative Learning. Several Cooperative Learning approaches are described below.

- ***Jigsaw*** - Each student, in a four to five member team, is given information for only one part of the learning activity. However, each student needs to know all information to be successful. Students work cooperatively in two different teams, their original team and an expert team. All students in the expert team seek the same information, study it, and decide how best to teach it to their peers in the original team. After this is accomplished, students return to their original teams to teach their portion of the lesson to the others in the team. For additional information on Jigsaw go to www.jigsaw.org.

- ***Think-Pair-Share*** - This strategy can be used before introducing new concepts. It gives everyone in the class time to access prior knowledge and provides a chance for them to share their ideas with someone. Think-Pair-Share helps students organize their knowledge and motivates learning of new topics. There are three steps to Think-Pair-Share with a time limit on each step signaled by the teacher. (1) Students are asked to brainstorm a concept individually and organize their thoughts on paper. (2) Students pair up and compile a list of their ideas. (3) Each pair will then share with the entire class until all ideas have been recorded and discussed.

- ***Send-a-Problem*** - Students are placed in heterogeneous teams of four. Each team designs a problem to send around the class. The other teams solve the problem. Since all of the teams send their own problem, there are a series of problems solved in this one activity. Results are shared with the class.

- ***Round Robin*** - Students are placed in heterogeneous teams of four. Each student has an opportunity to speak without being interrupted. The discussion moves clockwise around the team; everyone must contribute to the topic. The team may use an item to pass around as a visual aid to

determine who has the floor. Round Table is another version. The difference being that a piece of paper is passed around and each member writes instead of speaks about the topic.

- ***Mind Mapping*** - Mind Mapping is the process of visually depicting a central concept with symbols, images, colors, keywords, and branches. This is a fast and fun way to take visual notes, foster creativity, stretch students' visual thinking skills, make learning contextual and meaningful, and promote active involvement with the learning content. Pairs of students may create their own mind map or they may simultaneously add to the team and/or class mind map.

PERSONALIZED APPROACH

According to the National Educational Technology Plan developed by the US Department of Education, personalized learning means adjusting the pace (individualization), adjusting the approach (differentiation), and connecting to the learner's interests and experiences. Personalization, in theory, is broader than mere individualization or differentiation in that it affords the learner a degree of choice about learning. Individualization refers to the strategies aiming to guarantee all students' mastery of the same learning objectives by adjusting the pace to the progression of the learner. The teacher (or computer) manages the best solution based on learner performance. Personalization does take into account the pace at which the learner is progressing, but also aims to use the entire potential of the learner—his abilities, sensibilities, and competencies (including emotional ones)— to develop his aptitudes, capabilities and talents.

Individualized instruction is a method of instruction in which content, instructional technology (such as materials) and pace of learning are based upon the abilities and interests of each individual learner. Mass instruction is the opposite, that is a method in which content, materials and pace of learning are the same for all students in a classroom or course. Individualized instruction does not require a one-to-one student/teacher ratio. Mass instruction began during the French Revolution and Industrial Revolution, where some citizens were considered equal and large numbers of workers were needed to produce goods in large scale. The idea was to teach groups of students the same skills at the same time in a classroom, instead of having teachers that had in consideration the previous skills of the students as done for centuries. This method reduced costs and time, two important aspects in the era.

According to researcher Eduard Pogorskiy:

ICT and communications technology can be a powerful tool for personalized learning as it allows learners access to research and information, and provides a mechanism for communication, debate, and recording learning achievements. However, personalized learning is not exclusive to digital technologies or environments. In the rhetoric around 21st Century Skills, personalized learning is often equated with 'customization' (as found in the business world), with digital personalization used to the frame the learning

experience as highly efficient. Problematic in this is the discounting of the highly relational and socially constructed space well defined in the research on learning. Narrowing personalized learning to its digital form also raises the concern of the echo chamber effect emerging in (hyper)personalized online experiences.

Advocates often discuss personalized learning in the context of schools but education can happen anywhere, for example in the home or in the community. Personalized learning can happen in partnership with other learners, for example learners working together in a group to study a particular topic. Enthusiasts sometimes discuss the topic by referring to 'anywhere, anytime, anyplace' learning.

Phases of learning

According to the International Association for K-12 Online Learning, learning occurs in five phases in a personalized environment. The first phase is the assessment phase, followed by the teaching and learning phase. The third phase is curriculum choice. The departure from typical education models is the fourth phase, and the final phase is education beyond the classroom.

Role of the teacher

Many advocates of personalized learning argue that the role of the teacher in a personalized learning environment is different from that of a teacher plays in a traditional classroom. Teachers assess students' performance levels and foster collegial environments where significant interactions occur through flexible scheduling.

Instructional design

Proponents of personalized learning say that many elements of curriculum, assessment and instructional design must be present in classrooms for students to succeed and often use software systems to manage and facilitate student-led instruction. Proponents argue that classroom learning activities must build upon students' prior knowledge and teachers need to allocate time for practice. Advocates argue that teachers must continuously assess student learning against clearly defined standards and goals and student input into the assessment process is integral.

Debate

Andy Hargreaves and Dennis Shirley write that while there are advantages in students being able to access information instantly on-line, one should not mistake such processes for "something deeper, more challenging, and more connected to compelling issues in their world and their lives."

Holistic Approach

A holistic view means that we are interested in engaging and developing the whole person. You can think of this as different levels, physical, emotional, mental and spiritual. It's the concept that the human being is multi-dimensional. We have conscious and unconscious aspects, rational and irrational aspects. We are a bodymind. Not just intellect, but emotion, instinct, intuition, as well. We support people in using all of their 'multiple intelligence' that means insight, rationality, logic, emotion, hunches, gut feel, creativity, a sense of harmony and rhythm. We believe there are more than five senses, and we wish people to use the information from all their senses, and assist them in developing 'uncommon sense'.

Our vision of the holistic leader means somebody who acknowledges and honours their own complexity, who recognises that we all co-create our world, and who takes responsibility for their own part in this process. It is a vision of a leader who draws on their inner and outer natural resources... all their inner resources as a human being: intellect, insight, intuition, imagination and so on. And who also draws on the outer resources in their natural, social and political environment.

Holistic Psychology

Holism refers to any approach that emphasizes the whole rather than their constituent parts. In other words 'the whole is greater than the sum of its parts'. Qualitative methods of the humanistic approach reflect a holistic position. Social psychology also takes a holistic view.

A holistic approach therefore suggests that there are different levels of explanation and that at each level there are "emergent properties" that cannot be reduced to the one below.

Reductionist explanations, which might work in some circumstances, are considered inappropriate to the study of human subjectivity because here the emergent property that we have to take account of is that of the "whole person". Otherwise it makes no sense to try to understand the meaning of anything that anybody might do.

Examples of Holism in Psychology

- Humanistic psychology investigates all aspects of the individual as well as the interactions between people.
- Social Psychology looks at the behavior of individuals in a social context. Group behavior (e.g. conformity, de-individualization) may show characteristics that are greater than the sum of the individuals which comprise it.
- Psychoanalysis – Freud adopted an interactionist approach, in that he considered that behavior was the results of dynamic interaction between id, ego and superego.

- Abnormal psychology – mental disorders are often explained by an interaction of biological, psychological and environmental factors. An eclectic approach to therapy is often taken using drugs and psychotherapy.

Perception – This is were the brain understands and interprets sensory information. Visual illusions show that humans perceive more than the sum of the sensations on the retina.