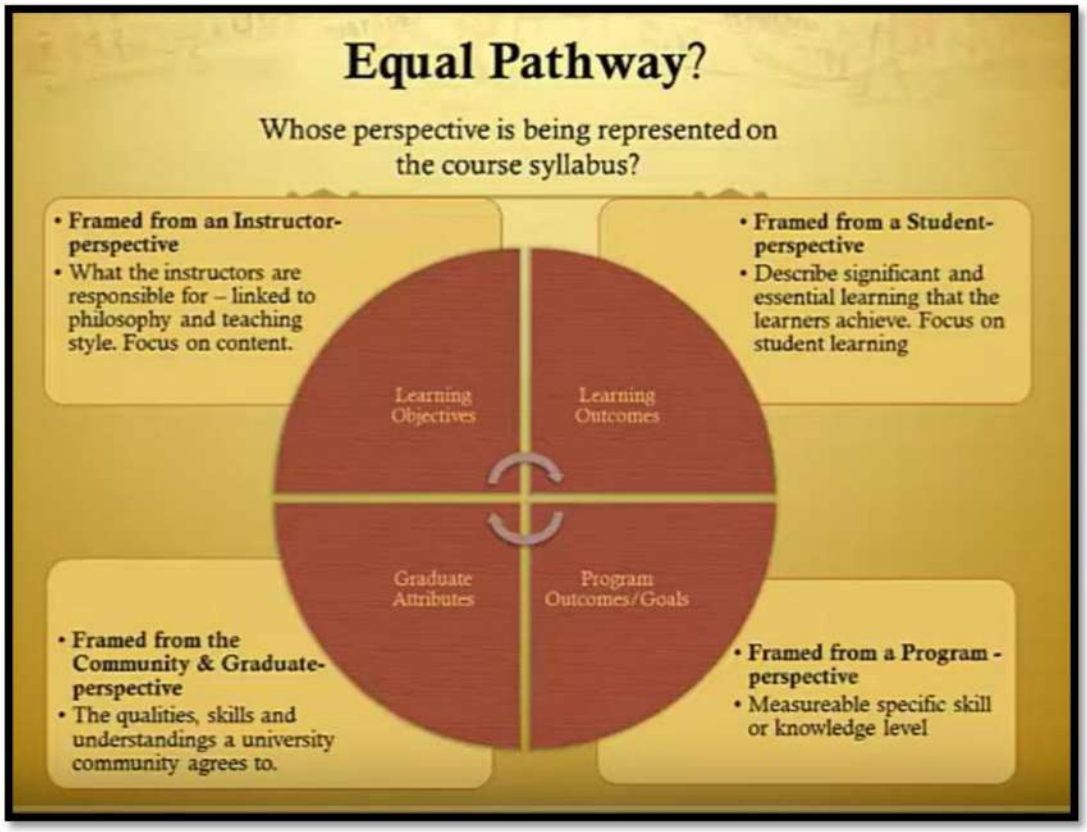
Learning Outcomes and Pedagogy



What is the difference between Learning Outcomes and Learning Objectives?

Learning Objectives:

- Tend to describe specific, discrete units of knowledge and skill
- were useful during the 1970's and 1980's when attempts were made to describe workplace activities as specific tasks to be completed
- can be accomplished within a short time frame - still may be relevant for a class period
- tend to be statements of intent; do not necessarily suggest that the behavior has been demonstrated

Learning Outcomes:

- describe broad aspects of behaviour which incorporate a wide range of knowledge and skill
- increased use in the 1990's when workplace requirements involve broader skill sets which are transferable to a wide range of work settings
- accomplished over time in several learning experiences
- refer to demonstrations of performance

OBJECTIVE
|
INSTRUCTION
|
OUTCOMES

Importance of Learning Outcomes

Children enter school with their own learning experiences. The school undertakes the responsibility of building further learning on the child's existing experiences. Therefore, at no stage or class do we start from 'no learning'. A teacher, who is a facilitator and mentor of students' learning, needs to be made aware about various pedagogies and also the progress in the child's learning. This is important for providing quality Education for All. This concern has been reflected in the Right of Children to Free and Compulsory Education (RTE) Act 2009; the Twelfth Five Year Plan of India; and the Sustainable Development Goals at the global level.

Need for learning outcomes

Quality improvement in education encompasses the all-round development of learners. This requires a multi-pronged approach aiming at quality curriculum and its effective transaction in an enabling environment. The RTE Act 2009 emphasises Continuous and Comprehensive Evaluation (CCE) to help teachers to develop an understanding on the learning progression of individual children, identify the learning gaps and bridge them in time to facilitate their growth and development in a stress free environment. However, in the present scenario, besides students and teachers, parents, community members and educational administrators are also keen to know about the learning of students and thus, monitor the progress of learning of their wards. For this, they need and demand some criteria against which the extent of expected learning could be mapped or assessed.

The literature on 'Education for All' (EFA), in the last three decades emphasised on quality of education. It has been considered in terms of enrolment, retention and achievement. It further included desirable characteristics of learners, learning processes, facilities, learning materials, contents, governance and management and learning outcomes. Improving the quality of learning has consistently been in focus under the Sarva Shiksha Abhiyan (SSA), and the Right to Education (RTE) Act. However, reports (Global Monitoring Report (GMR)–2015), achievement surveys (Annual Status of Education Report (ASER) , National Achievement Survey (NAS) of Class III, (MHRD, 2014), report a decline in outcomes of reading, mathematical and numerical abilities of children. Keeping this in view, quality, as measured by learning outcomes to be achieved by all, especially for literacy, numeracy and essential life skills is crucial.

Most often, teachers are not clear about what kind of learning is desired and the criteria against which it could be assessed.They use textbooks as the complete curriculum and assess children using questions given at the unit end exercises. The contextual variations in textual material and variations in pedagogy adopted are generally not taken into account, for there are no criteria to assess them. The learning outcomes for each class not only help the teachers to direct their teaching-learning in the desired manner but make other stakeholders, especially the parents or guardians, School Management Committee (SMC) members, community and the state functionaries to be responsible and alert towards their role for ensuring quality education.

Why the Shift

The National Policy on Education (NPE) 1986, revised in 1992 and the Programme of Action (PoA) 1992 emphasised that the Minimum Levels of Learning (MLLs) should be laid down and children's learning should periodically be assessed to keep a track of their progress towards ensuring the achievement of NPE goal that 'all children should acquire at least minimum levels of learning'. The

MLLs developed class-wise and subject-wise for primary stage in 1992 in the form of competencies were highly product-oriented and had a limited scope for assessment of the overall development of children.

A radical shift came almost a decade ago when the child's capacity to construct knowledge as a natural learner was recognised as central to the transaction of the curriculum, and the teacher's role was primarily as a facilitator of the learning process. The knowledge, thus gained, is an outcome of their engagement with the world around when they explore, respond, invent, and make meaning of it. It means that the focus shifted to the process of learning. It envisaged conceptual understanding as a continuous process, i.e., the process of deepening and enriching connections acquiring more layers of dispositions, emotions as an integral component of cognitive development, making meaning and developing the capacity of abstract thinking and reflection.

The overall development of a child through education, conceptualised as a fundamental right under the Right to Free and Compulsory Education Act 2009, had been a priority of almost all policy documents. The document, Minimum Levels of Learning at Primary Stage, too recognised this, yet expressed difficulty in dealing with the psychomotor and affective domains. The reasons for this were mentioned as: difficulty of assessing affective qualities with precision and through paper- pencil test as they are intangible and subjective, influenced by personal preferences and prejudices besides the uncertainty of their full development. The document considered them to be a part of the process of development and change in the students' personality rather than being the final product of specific inputs and processes.

Against this backdrop, an exercise was undertaken to relook into the whole process with a fresh perspective and devise learning outcomes for different curricular areas of the elementary stage (Classes I- VIII).

About Learning Outcomes document

The learning outcomes document that has been evolved by NCERT mentions distinctly the learning outcomes for each class in Languages (Hindi, English and Urdu), Mathematics, Environmental Studies, Science and Social Science up to the Elementary Stage. The document is meant for all stakeholders especially the parents/guardians, teachers, SMC and community members. Some features of the document are :

- To make it user-friendly, simple language has been used as far as possible across the document.
- The section under each curricular area comprises a brief understanding about the nature of the subject, followed by the curricular expectations, which are the long-term goals that students need to acquire over a period of time, and are therefore spelt out stage-wise.
- Thelearning outcomes defined class-wise are process-based which provide the check-points that are measurable in

  a qualitative or quantitative manner to assess the progress of a child as per the expected holistic learning for the

  overall development of a child.
- To help the teachers understand and achieve the learning outcomes as per the curricular expectations, some

  suggestive pedagogical processes are provided in the columns adjacent to that of learning outcomes.

- Using contextual resources and appropriate learning processes, the teachers can design and provide a variety of
- learning situations/opportunities as per the need of different learners in an inclusive classroom.
- The pedagogical processes are suggestive and do not correspond one-to-one with the learning outcomes mentioned

  in the adjacent column but may be looked at holistically. The teachers may adopt/adapt and can even design many

  more as per the availability of resources and local context.
- Care has been taken that the learning outcomes defined in each curricular area are spirally linked in terms of age

  appropriateness and complexity within and across curricular areas and stages.
- The class-wise section may not be viewed in isolation. Holistic perspective will help accomplish the goal of overall development of a child.

Learning outcomes for Children with Special Needs (CSN)

Inclusion is all about providing effective learning opportunities to all students. The learning outcomes are the same for all children provided that these are balanced and brought in harmony with the individual needs of each child. The Special Educational Needs (SEN) may emanate from a number of reasons, disability conditions could be one such reason. Accordingly, they need to be facilitated with different aids such as mobility aids (wheel chair, crutches, white cane), hearing-aids, optical or non-optical aids, educational aids like Taylor frames, the abacus, etc. and modifying the learning situations suiting their needs; sensitising other children to help them in need; to ensure their participation in the learning process; to help them progress like other children.

Following are a few more points to facilitate Children with Special Needs accomplish the learning outcomes.

- Additional time and a suitable mode for the successful completion of tests
- Modification of the curriculum because it presents specific difficulties for them
- Provision of adapted, modified, or alternative activities in different content areas
- Accessible texts and materials to suit their ages and levels of learning
- Respect for home languages andrelating to his/her socio-cultural milieu (e.g., traditions and customary practices etc)
- Appropriate management of classrooms (e.g., management of noise, glare, etc.)
- Provision of additional support by using (Information and Communications Technology (ICT), video or digitised formats
- Some additional subject specific guidelines to address the learning needs of children with varied disabilities are mentioned in each section of learning outcomes for a particular curricular area. The learning difficulties mentioned need to be taken care of to help children with special education needs accomplish the identified learning outcomes under each curricular area. The accomplishment of Learning Outcomes by children with severe cognitive impairments (intellectually challenged) may be kept flexible, if need be

  Source : NCERT - Learning outcomes at Elementary stage

Group-4

Bloom's Taxonomy of Action Verbs: Cognitive Domain

Level	Remembering	Understanding	Applying	Analysing	Evaluating	Creating
Definition	Remember previously learned information.	Demonstrate an understanding of the facts.	Apply knowledge to actual situations.	Break down objects or ideas into simpler parts and find evidence to support generalizations.	Make and defend judgments based on internal evidence or external criteria.	Compile component ideas into a new whole or propose alternative solutions.
Verbs	• arrange • define • describe • duplicate • identify • label • list • match • memorize • name • order • outline • recognize • relate • recall • repeat • reproduce • select • state	• classify • convert • defend • describe • discuss • distinguish • estimate • explain • express • extend • generalized • give example(s) • identify • indicate • infer • locate • paraphrase • predict • recognize • rewrite • review • select • summarize • translate	• apply • change • choose • compute • demonstrate • discover • dramatize • employ • illustrate • interpret • manipulate • modify • operate • practice • predict • prepare • produce • relate • schedule • show • sketch • solve • use • write	• analyze • appraise • breakdown • calculate • categorize • compare • contrast • criticize • diagram • differentiate • discriminate • distinguish • examine • experiment • identify • illustrate • infer • model • outline • point out • question • relate • select • separate • subdivide • test	• appraise • argue • assess • attach • choose • compare • conclude • contrast • defend • describe • discriminate • estimate • evaluate • explain • judge • justify • interpret • relate • predict • rate • select • summarize • support • value	• arrange • assemble • categorize • collect • combine • comply • compose • construct • create • design • develop • devise • explain •formulate • generate • plan • prepare • rearrange • reconstruct • relate • reorganize • revise • rewrite • set up • summarize • synthesize

Group-5

Bloom's Taxonomy of Affective Domain

Level	Receiving	Responding	Valuing	Organizing	Internalizing value
Definition	Selectively attend to stimuli. Awareness, willingness to hear, selected attention	Respond to stimuli. Show interest in objects, phenomena or activity by seeking it out or pursuing it with pleasure. (Motivation)	Attach value or worth to something. Internalization of an appreciation for the objectives, phenomena or activity	Conceptualize a value and resolve conflict between it and other values.	Integrate the values into a value system that controls the behavior.
Examples	Listens to others with respect. Listen for and remember the name of newly introduced people.	Participates in class discussion. Gives a presentation. Questions new ideas, concepts, models etc. in order to fully understand them. Knows the safety rules and practices them.	Demonstrates belief in the democratic process. Is sensitive towards individual and cultural differences. Shows the ability to solve problems. Proposes a plan for improvement in class cleanliness and follows through with commitment.	Recognizes the need for balance between freedom and responsible behavior. Accepts responsibility for one's behavior. Explains the role of systematic planning in solving problems. Prioritizes time effectively to meet the needs of the school, family and self.	Shows self-reliance when working independently. Cooperates in group activities. Uses an objective approach in problem solving. Revises judgements and changes behavior considering new evidence. Values people for what they are, not how they look.

Group-6

Simpson's Taxonomy of Psychomotor Domain

Level	Perceive	Set	Guided response	Mechanize	Complex Overt response (Expert)	Adaptation	Origination
Definition	Ability to use sensory cues to guide motor activity	Readiness to act. It includes mental, physical and emotional sets. These three sets are dispositions that predetermine a person's response in different situations(Mindset)	The early stages in learning a complex skill that includes imitation, trial and error. Adequacy of performance is achieved by practicing.	Intermediate stage in learning a complex skill. Learnt responses have become habitual and the movements can be performed with some confidence and proficiency.	Skilful performance of motor acts that involve complex movement patterns. Proficiency is indicated by a quick, accurate and highly coordinated performance, requiring minimum energy. Performing without hesitation and automatically	Skills are well developed, and the individual can also modify actions to fit special requirements.	Ability to create new movement patterns tofit a situation or specific problem. Outcomes depict creativity based on highly developed skills.
Examples	Separates metallic from non-metallic out of the given vessels	Describes the procedure for finding the time period of a simple pendulum.	Determines the density of the given Stone by following instructions	Sets up an experiment to check if a liquid can conduct, using deflection in the magnetic needle on passing current through the liquid.	Identifies which of the given liquids is a conductor by deploying deflection of magnetic needle in a previously used circuit.	Devices a method to identify the positive and negative terminals of a battery on which the markings are not visible.	Designs and creates artwork which use glowing LEDs.

Identifying Domain & Cognitive level of educational outcomes

Time: 10 minutes

Some instructional outcomes are given in the table below. Identify the domain of each (Cognitive/affective/psychomotor). Also identify the competency/level for each of the learning outcome belonging to cognitive domain (Remembering/understanding/applying/analyzing/evaluating/creating).

S. No.	Learning outcome	Domain (Cognitive/affective/psychomotor)	Competency/level of cognitive domain
1.	Identify the noun and their kinds		
2.	Assess whether a bulb in the given circuit will glow or not		
3.	Measure the time period of a simple pendulum using a stopwatch		
4.	Design a model to show the movement of Earth.		
5.	List various parts of speech		
6.	Distinguish between the place value and face value of the given numbers		
7.	Limit the intake of carbonated drinks after learning about their acidic nature		
8.	Plan a strategy to deal with the situation created in the neighborhood by natural disaster		
9.	Compare and contrast the characters of the drama.		
10.	Distinguish between line and line segment		
11.	Calculate the value of one division on a given thermometer		
12.	Prepare an acid-base indicator from the extract of colored flowers		
13.	Relate the common feature of democratic government and secular form of governance.		
14.	Propose a plan to stop using single use plastics after learning of their non-biodegradable nature		
15.	Select the correct statement from the given sentences.		

FORMAT OF LEARNING OUTCOMES

All learning outcomes have a common format:

Subject	Verb	Object
S	V	O

- **The SUBJECT** of the Learning Outcome Statement

The SUBJECT of the learning outcome statement is the student or the learner.

***Examples**:*

- *Each student will be able to use word processing, spreadsheets, databases, and presentation graphics in preparing their final research project and report.*
- *Upon completion of the module on educational objectives, students will be able to classify specific educational objectives into the cognitive (knowing), psychomotor (doing) and affective (feeling) learning domains.*

- The **VERB** of the Learning Outcome Statement

Each verb in a learning outcome statement represents a cognitive process.
Learning outcomes should consider the different types of cognitive processes involved in knowledge retention and transfer.

Cognitive Process	Description
Remember	Retrieve relevant knowledge from long-term memory
Understand	Construct meaning from oral, written, and graphic communication
Apply	Carry out or use a procedure in a given situation
Analyze	Break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose
Evaluate	Make judgments based on criteria and standards
Create	Put elements together to form a structure or reorganize elements into a new structure

The Cognitive Process Dimensions shows action verbs in increasing order of complexity that are directly related to cognitive processes. Please note that verbs such as list, state, and write cannot be used as verbs in learning outcome statements because they do not have anything to do with cognitive processes.

- **The OBJECT** of the Learning Outcome Statement.

The object of the learning outcome statement is derived most often from the **course content.**

DESIGN A LEARNING OUTCOME FOR A CONCEPT THAT IS PART OF YOUR SYLLABUS

S _____

V _____

O _____

LEARNING OUTCOME

_____

Examples of "21st Century competencies" include:

1. Creativity and Innovation
2. Critical thinking and problem solving
3. Capacity for lifelong learning
4. Collaboration
5. Communication
6. Citizenship and Character
7. Computational thinking

How to incorporate these competencies in teaching learning process

➢ 1. CREATIVE EDUCATION

Creative education is when students are able to use imagination and critical thinking to create new and meaningful forms of ideas where they can take risks, be independent and flexible. Instead of being taught to reiterate what was learned, students learn to develop their ability to find various solutions to a problem.
Coming up with various out-of-the box solutions is known as **divergent thinking**

Why Creative education?
Creation of more divergent thinkers in education, science, politics and every sphere to be able to solve complex problems plaguing the world.

How to nurture Creativity in classroom

- Don't limit assignments to one format. For example, instead of limiting the student to the writing assignment, they can create a podcast, video, role playing, poem, composing songs, etc.
- Don't set time aside for creativity. Design the lesson plan such that creativity is an integral part of regular teaching learning process.
- Use technology to broaden your idea of assignments. For example, you can use Google Maps to differentiate between distance and displacement, integrate it with geography and make the class more interactive.
- Introduce unconventional learning materials into class. Besides using the books in the classrooms, you can use educational podcasts and videos, such as Radiolab and Ted Talks, which can create entertainment with education
- Reward creative ideas, thoughts and products
- Encourage risk-taking, allowing mistakes, and imagining from various perspectives

➢ 2. CRITICAL THINKING & PROBLEM SOLVING

Critical thinking means being able to **present evidence for our ideas**, **analyzing the way we think** instead of simply learning facts without ever questioning them.
Problem solving refers to the ability to use knowledge, facts, and data to effectively solve problems. This doesn't mean you need to have an immediate answer, it means you have to be able to think on your feet, assess problems and find solutions. The ability to develop a well thought out solution within a reasonable time frame, however, is a skill greatly required at every step in life.

Why critical thinking:

a. Students are being prepared for jobs that don't exist yet.
b. Improves Students' flexibility and learning skills
c. Essence of democracy
d. Makes education less passive and more interactive
e. Helps students better express their ideas
f. Help in making next generation more adaptable to changes

What is problem-based learning (PBL)?

Problem-based learning is approach that uses creative & critical thinking to help learners solve real-world problems that may or may not have a 'definite' solution. The focus is on developing conceptual understanding and skills such as creative & critical thinking skills, research skills etc rather than finding a 'right' answer. It is a dynamic and student-centric approach, as learning is driven by the motivation to solve problems rather than direct instruction from the teacher.

What is the Maastricht 7-jump process of problem-based learning?

The seven steps that may be followed by learners are:

1. **discuss the case** and make sure everyone understands the problem
2. **identify the questions** that need to be answered to shed light on the case
3. **brainstorm** what the group already knows and identify potential solutions
4. **analyze and structure** the results of the brainstorming session
5. **formulate learning objectives** for the knowledge that is still lacking
6. **do independent study**, individually or in smaller groups: read articles or books, perform experiments or attend lectures to gain the required knowledge
7. **discuss** the findings

What is the role of the teacher in problem-based learning?

The teacher's role in PBL is very different from that in the traditional classroom. The teacher does not explicitly instruct but rather plays the role of a guide and coach. When PBL is initially introduced, students may not have the skills needed, so the teacher may model the creative thinking skills required to solve the problem, by posing questions along with the students or by offering an alternative perspective. However, the teacher must take care to ensure that he or she is not over-involved in the students' explorations or leading that in a unilateral direction of thought.

As the students gain more experience of solving problems, the teacher is expected to gradually withdraw the amount of coaching and empower the students to learn independently. When students have reached this stage, the teacher's role is limited to posing the problems, and monitoring the groups to ensure the learning outcomes are met.

How is problem-based learning different from traditional learning?

Problem Based Learning	**Traditional Learning**
Student-led	Teacher-led
Scope for application extends beyond the classroom	Scope for application is limited to the classroom
Students are given a problem to solve	Students are told what they need to know
Typically occurs in groups	Typically occurs in a whole group or individually
Problems used for the development of concepts, skills and knowledge	Problems used as examples to explain content

➢ 3. CAPACITY FOR LIFELONG LEARNING:

Lifelong learning is defined as "all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or

employment-related perspective".
It is often considered as the learning that occurs after the formal educational years of childhood and into adulthood. It is sought out naturally through life experiences as the learner seeks to gain knowledge for professional or personal reasons.
'Knowledge results from the combination of grasping experience and transforming it' (Kolb 1984: 41).
The concept of lifelong learning has become of vital importance with the emergence of new technologies that change how we receive and gather information, collaborate with others, and communicate.

Students can take up their community service assignments for Successful concept of study circles, an idea launched almost a century ago, still represents a large portion of the adult education provision. The concept has since spread, and for instance, is a common practice in Finland as well. A study circle is one of the most democratic forms of a learning environment that has been created. There are no teachers and the group decides on what content will be covered, scope will be used, as well as a delivery method.
adult literacy/literacy of dropouts.

➢ 4. COLLABORATION:

Collaborative learning is the most ideal approach to learning given that it enables students to benefit from guidance from peers and teachers. Vygotsky's work highlighted the importance of interactions and communication with others during the learning process, which is the main advantage offered by collaborative learning.

What is collaborative learning?
Collaborative learning is a process in which multiple individuals come together to learn by tapping into each other's prior knowledge, skills and resources through active discussion. In collaborative learning, all members of a group are accountable to each other in completing the common task. Debates, collaborative writing assignments, role plays and study teams all fall into this category.

How is collaborative learning different from cooperative/group learning?

Collaborative learning	**Cooperative/group Learning**
Oriented towards group's learning goals	Oriented towards accomplishing individual learning goals within group goals
Learning relies on shared conceptual understandings, which emerges from discussion	Learning is dependent on individuals' conceptual understandings which may or may not be discussed, but tends to be shared
Roles & responsibilities are shared across the group; interactions are the primary mode of learning	Individual members of the group have different roles and responsibilities; minimal interaction

Why collaborative learning?

- 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.

➢ 5. COMMUNICATION:

Communication competence refers to the ability to articulate ideas and thoughts in variety of forms and contexts. More specifically, the ability to listen effectively so as to understand the main points being made by others and to utilize different modes of communication as appropriate for specific purposes (e.g. persuading, arguing or providing appropriate information)

Basic speaking & learning competencies:

For developing effective speaking & listening competence, students should be able to do the following by the time they graduate from the school:

- State ideas clearly.
- Communicate ethically.
- Recognize when it is appropriate to communicate.
- Identify their communication goals.
- Select the most appropriate and effective medium for communicating.
- Demonstrate credibility.
- Identify and manage misunderstandings.
- Manage conflict.
- Be open-minded about another's point of view.
- Listen attentively.
- Formulate appropriate questions

Why communication skills in science learning?

Communication skills are a requisite for scientific literacy for

- Obtaining, evaluating and communicating information
- communicating within a wide range of local, national and global communities
- communicating scientific ideas with others during the process of scientific inquiry in a positive way to facilitate further communication and discussion of the related scientific issues.

- Communicating their ideas on science and socio-scientific issues with others via both verbal and written dialogue
- articulating their ideas, thoughts and feelings by using a variety of verbal and visual representations (e.g. words, images, gestures etc.)
- delivering key messages taken from complex ideas in an efficient and effective manner.
- Ability to listen carefully so as to understand the main ideas involved in an argument, detecting bias, recognizing over generalization, and detecting claims during ongoing conversations.
- Developing a shared understanding tempered with empathy and based on commitment to treating others with respect.

➢ 6. CITIZENSHIP & CHARACTER

Citizenship and character competence refers to the ability to guide individual actions as a person for the common good of the community, so that an individual uses personal values for the service of the community.
While values and character are by personal by their very nature personal, citizenship is a very public concept.

Why Citizen & Character Education (CCE)?

CCE is of immense importance, especially in our increasingly global context. We are confronted with so many choices every day, and the choices we make as individuals have repercussions on the community we live in.

A student can be made aware of his role, his responsibilities and his rights at different levels of his existence e.g. as an individual, as a member of his class, as a student of the school, as a resident of a locality, as a citizen of a state/country and as a global citizen. This allows him to make choices based on his awareness and the values that he holds. CCE helps them make choices that are defensible, informed and not only serve their own interests but also to think about the larger community

How to teach character and citizenship in school?

- One way to help our students make good choices – and choose good values – is to expose them to rich learning experiences and help them to reflect on the choices they make.

- CCE, it's more than just transmitting a body of knowledge. You have to apply it, and application comes with deep understanding. It has to be a lived experience – how you live in the school, how you live as a person, how you live out your values in the public domain.

- It is important to involve our learners in co-constructing meanings in the CCE curriculum. Classroom instruction and climate can be enhanced so as to improve students' confidence to participate more actively.

  In doing so, we are also teaching them citizenship – that their views count and they are valued as part of the community

- While some may view citizenship in national terms, focusing on local issues and patriotism, living in a global society is about recognizing that global issues like social injustice, climate change and war can equally affect us and require us to take action to resolve them.

- Discussions on scientific topics that lead to an appreciation that citizenship is multi-layered – always grounded in the local context, but also national and global. With globalization, even our identities have become multiple and complex, derived from ethnicities, religions, political affiliations, as well as transnational influences like social media.

  Citizenship education should therefore help young students understand and address pressing social issues that are not only local, but also affecting nations and communities everywhere."

- It is important for teachers to think about the nature of critical thinking they want students to engage in, not just to be better workers, but also to challenge assumptions, think critically about policies and government decisions, and form their own conclusions.

  Take the issue of global climate change for example. For students to see how they can help address the problem requires an understanding of not just the economics, politics and history of climate change, but also the different narratives of what "progress" is.

- Experiences like educational travel, Internet collaboration to solve problems e.g Asteroid search program of NASA

➢ 7. COMPUTATIONAL THINKING (CT)

Computational thinking refers to the thought process involved in formulating a problem and its solution in step-by-step sequences of simple operations that can be understood by a computer or a human or both.

Computational Thinking = critical thinking skills + power of computing

Computational thinking allows students to move from being consumers of technology to being builders of tools that benefit society

Four steps of computational thinking

Decomposition: Break a problem into parts or steps

Pattern recognition: Recognize and find patterns or trends

Algorithm writing: Develop instructions to solve a problem or steps for a task

Abstraction: Generalize patterns and trends into rules, principles or insights

How to incorporate CT in science classroom?

We can teach computational thinking without any technology at all.

- **Teaching Decomposition**

Teaching decomposition to young learners means that students are invited into problem-solving scenarios. Teachers share the complex, multi-step problem and facilitate conversations that help students to break it down. While students at these ages are not always developmentally ready for multi-step directions or problems, they are ready to be exposed to models of adult thinking. In doing this, students begin to develop a framework of strategic, computational thinking.

Ideas to Try: Teachers might describe a scenario, such as planning a trip to a science museum, that involves multiple steps. This type of task can quickly become overwhelming without an organized to-do list of smaller, more approachable challenges. Students can help to break down the larger task, and the teacher can help to draw or write a visual representation of their thinking, giving students a mental map of how to solve similar problems in the future.

- **Teaching Pattern Recognition**

Pattern recognition, as a cornerstone of computational thinking, begins with the basic ABAB pattern creation that is taught in the primary grades and extends to more complex layers of thinking. Pattern recognition invites students to analyze similar objects or experiences and identify commonalities. By finding what the objects or experiences have in common, young students can begin to develop an understanding of trends and are therefore able to make predictions.

Ideas to Try: To teach students to recognize patterns, you might begin by investigating trees. What do all trees have in common? They all have a trunk. They all have roots. They all have branches. While there are many differences between types of trees, these components are present in all trees.

Next, work with your students to create a collage of trees. Notice how they all have trunks, roots, and branches. Then, talk about how the trunks differ from one another. Some are thick, while others are thin. Some are brown, while others are white. Talk about how the roots and branches differ.

To extend this thinking, invite your students to draw a picture of a tree, labeling the trunk, roots, and branches. Emphasize that while your class' trees might look different from one another, they are alike in their core components.

Finding patterns simplifies tasks because you can use what you already know. By teaching students to recognize patterns, their awareness of the world around them expands. This helps them to use the patterns they have identified to solve future problems and make predictions about the world.

- **Teaching Abstraction**

Abstraction is focusing on the information that is relevant and important. It involves separating core information from extraneous details.

Ideas to Try: In primary classrooms, teachers naturally teach kids the concept of abstraction with literature as they identify the main idea and key details. To take this one step further, teachers can encourage students to hunt for information, clues, or treasures by giving them a goal as they approach a book or even an experience. As students listen to a speaker during a school presentation about dental hygiene, a kindergarten class might be hunting for details about brushing your teeth. By teaching students abstraction, they are able to sort through all of the information available to identify the specific information they need. This is an invaluable skill as students read larger texts and are presented with more and more complex information.

- **Teaching Algorithms**

Algorithmic thinking involves developing solutions to a problem. Specifically, it creates sequential rules to follow in order to solve a problem. In the early grades, kids can learn that the order of how something is done can have an effect.

Ideas to Try: To present this idea to students, you might ask them to think about making a sandwich. What should we do first? Second? What if I put the cheese and lettuce on my sandwich before I add the mayonnaise? Conversations about sequence and order develop the foundations of algorithmic thinking.

To get students thinking in algorithms, invite them to design the path from their classroom to the gym by detailing a series of steps. Then, let them try it out! Additionally, invite students to think about their morning routine. What steps do they take to get ready for school each morning? How would the order impact the outcome? Asking students to consider achieve the desired result. how inputs change the outcome encourages them to be reflective in their thinking and to make changes to their plan

Introduction:

Processes of learning will become most powerful and effective if the pupils know why and for what they are learning certain pieces of Information, concepts and categories, skills, or modes and principles of behaviour in democratic communities. Phases of reflection and discussion should therefore not only draw general conclusions from concrete examples, but also address the whole process of learning. In terms of constructive learning, the pupils will become aware of their own personal approach to learning in general, and they will find out what type of learner they are, and what specific strengths and learning needs they have. Teaching in the spirit of human rights ("through") encourages teachers to give learners the space and time to learn according to their needs. We may then become aware of our profiles as learners as part of our identities.

Viewed from the perspective of democratic leadership, the teacher should not keep the learning outcomes at the back of his or her mind but share them with the pupils, which in itself turns lesson planning into an exercise in democratic decision making.

Finally, this form of meta-learning ("being aware of and taking control of one's own learning")in children's rights classes gives a model of how to teach pupils to organise their own processes of learning. In modern societies, processes of change – for ex-ample, technology, economy, globalisation or the environment – are becoming more dynamic and complex. This poses new challenges for future generations: in order to succeed in their jobs and to participate in decision making, they will engage in a lifelong process of learning, having to tackle problems no one in school can anticipate today. Our pupils therefore need to become experts in co-operative learning, project work, process assessment and problem solving. In this session ,we have suggested some small steps for children at the beginning of their lives as learners.

Effective teachers carefully plan and implement appropriate pedagogy to achieve intended learning outcomes.

Learning is dependent on the pedagogical approaches teachers use in the classroom. A variety of pedagogical approaches are common in schools, but some strategies are more effective and appropriate than others. The effectiveness of pedagogy often depends on the particular subject matter to be taught, on understanding the diverse needs of different learners, and on adapting to the on-the-ground conditions in the classroom and the surrounding context. In general, the best teachers believe in the capacity of their students to learn, and carefully utilize a range of pedagogical approaches to ensure that learning outcomes are achieved. **Active Learning involves students' active participation in learning keeping them engaged and resulting in achieving intended learning outcomes**

➢ ACTIVE LEARNING STRATEGIES

Included here are strategies designed to support students' active learning in a variety of contexts. The single most critical factor in selecting a strategy is ensuring that it directly supports the intended learning outcomes.

Targeted strategies for active learning:

1. Active collaborative learning
2. Case-Based Learning
3. Field-Based Learning
4. Inquiry-Based Learning
5. Lab-Based Learning
6. Problem-Based Learning
7. Experiential Learning
8. Community-Based Learning

➢ 1. ACTIVE COLLABORATIVE LEARNING

Team-Based Learning – is an active, collaborative learning and teaching strategy which uses a special sequence of individual study, group work, immediate feedback and teacher-facilitated discussion and debate to create a motivational framework for students' learning.

What is Team-Based Learning?

TBL takes a flipped approach to learning, with students being provided with or directed to learning resources to engage with before formal classes. The incentive to engage with the course content pre-class comes from a readiness assurance process (RAP), which includes a short summative individual readiness assurance test (iRAT) immediately followed by an identical team test (tRAT) to foster discussion, debate, and peer learning. Students and academic staff receive immediate feedback on team performance, allowing a focused class discussion on any troublesome course concepts. The majority of class time is dedicated to application exercises where students learn how to use their new knowledge to solve authentic, real-world problems, make collaborative team decisions, justify their decisions to other teams during discussion and debate, all facilitated by an academic teacher.

Benefits of Team-Based Learning

An analysis of the Team-Based Learning Literature shows early evidence of positive educational outcomes in terms of knowledge acquisition, participation and engagement, and team performance; however, the authors also acknowledge that more research is needed. Koles et al (2010) reported higher scores (+5.9%) in examination results with students who have studied using TBL with students demonstrating a larger increase (+7.9%). They concluded that TBL may enhance mastery of course content, with students in the lowest quartile benefiting the most. Evaluation of TBL modules at Bradford indicated that whole-cohort assessment outcomes improved when compared to the previous year (results increased by as much as 13%, alongside an increase in students achieving distinctions).

Some team based activities

A. Step Interview

Can be used as assessment of prior or new knowledge or opinion.

Learners work in pairs and then fours.

Learners interview a Learner and then share what they have learned.

Steps:

- The teacher provides the interview topic and states the duration of the interview.
- The teacher calls for 'think' time.
- In pairs, learner A interviews learner B.
- Learner A thanks and praises learner B.
- The pairs switch roles: learner B interviews learner A and again thanks and praises.
- The pairs then pair up to form groups of four.
- Round Robin: Each learner in turn shares with the team what he / she learned in the interview.

Examples of classroom applications

Maths – What can you remember about probability?'

Science - What do you know about the rock cycle/ homeostasis/ products from oil etc. – any revision topic

B. Inside Outside Circle

Used to introduce new information.

Learners work in large groups

steps:

1. This is a good structure for having learners share information in an exciting way.
2. Learners stand in two concentric circles around the classroom. Learners in the inside circle face out, facing a learner standing on the outside circle.
3. Learners from the inside circle share something with their partners.
4. Learners switch roles; the outside circle learners now share while their partners listen.
5. Learners rotate to work with new partners – rotate four people ahead to a new partner – vary by changing the number of positions advanced or switch the direction of the rotation; class counts aloud the number of positions they are moving so everyone knows when to stop. "One, two, THREE!" (Movement energizes learners.)
6. Learner's problem – solve or share with many partners and hear multiple perspectives.

Variations

- Learners rotate in pairs and discuss in groups of four; e.g. teacher asks question; inside circle pair discusses question while outside circle discusses questions; pairs compare answers.
- Learners generate questions they want to ask other learners in the classroom. Put the question in a hat and draw out one question each time the circles rotate.
- Flashcards – each learner makes up one question on a flashcard.
- Learners ask each other their questions and switch cards before each rotation. With each rotation, learners get a new partner and a new question.
- Teacher can supply the flashcards, or act as quality control by collecting and correcting cards before they are used.

C. Jigsaw Method

- A topic is divided into sections.
- In 'home' groups of four or five, pupils take a section each and then regroup into 'expert' groups.
- The experts work together on their chosen areas, then return to their home groups to report on their area of expertise**.**
- The home group is then set a task that requires the pupils to use the different areas of expertise for a joint outcome.
- This strategy requires advance planning, but is a very effective speaking and listening strategy because it ensures the participation of all pupils.

D. Mix and Match

Can be used to acquire new knowledge or recap a topic.

Learners work individually and then pair up

steps:

1. Give each learner a card (e.g., question and answer; similarities/differences)
2. With cards in hand, learners get up and move around the room trading cards with other learners as they pass by
3. When the teacher calls 'freeze', they all stop in their tracks and no more trading of cards is allowed
4. When the teacher calls 'match', learners actively seek out the partner who has their matching card
5. After all learners have found their perfect match, call 'mix' and they start again
6. Encourage learners to mix independently, not with friends. Model how to find a matching learner, if necessary

7. When learners have a Learner, they move to the outside of the room to allow more room for those still looking for a partner.

➢ 2. WHAT IS CASE-BASED LEARNING?

Using a case-based approach engages students in discussion of specific scenarios that resemble or typically are real-world examples. This method is learner-centered with intense interaction between participants as they build their knowledge and work together as a group to examine the case. The instructor's role is that of a facilitator while the students collaboratively analyze and address problems and resolve questions that have no single right answer.

Clyde Freeman Herreid provides eleven basic rules for case-based learning.

1. Tells a story.
2. Focuses on an interest-arousing issue.
3. Set in the past five years
4. Creates empathy with the central characters.
5. Includes quotations. There is no better way to understand a situation and to gain empathy for the characters
6. Relevant to the reader.
7. Must have pedagogic utility.
8. Conflict provoking.
9. Decision forcing.
10. Has generality.
11. Is short.

Why Use Case-Based Learning?

To *provide students with a relevant opportunity to see theory in practice.* Real world or authentic contexts expose students to viewpoints from multiple sources and see why people may want different outcomes. Students can also see how a decision will impact different participants, both positively and negatively.
To *require students to analyze data in order to reach a conclusion.* Since many assignments are open-ended, students can practice choosing appropriate analytic techniques as well. Instructors who use case-based learning say that their students are more engaged, interested, and involved in the class.
To *develop analytic, communicative and collaborative skills along with content knowledge.* In their effort to find solutions and reach decisions through discussion, students sort out factual data, apply analytic tools, articulate issues, reflect on their relevant experiences, and draw conclusions they can relate to new situations. In the process, they acquire substantive knowledge and develop analytic, collaborative, and communication skills.
Many faculty also use case studies in their curriculum to teach content, connect students with real life data, or provide opportunities for students to put themselves in the decision maker's shoes.

➢ 3. FIELD-BASED LEARNING

What is Field-Based Learning?

In field-based learning, teaching is extended to a site outside of the classroom or laboratory, exposing students to a real-world setting. Students learn though direct interaction with an environment that reflects taught concepts rather than learning through indirect presentations of the setting such as textbooks or lectures.

Why use Field-Based Learning?

Field-based learning may serve a diverse range of teaching aims and goals as students are provided with a perspective of materials, objects or phenomena that are not accessible in, or fully appreciated through, other settings.

Field-based learning is generally chosen because the experience:

- provides an opportunity to present materials, objects or phenomena that are not accessible otherwise to students in a way that enables direct contact and interaction
- provides students with an opportunity to practice skills or techniques that cannot be carried out elsewhere
- stimulates higher understanding and reinforcement of previously learned classroom material
- stimulates an appreciation for, concern or valuing of the visited environment

Field-Based Learning Teaching Strategies

When teaching one-day field studies:

Prepare: Establish the basic narrative/descriptive elements of the material to be studied on the field study before the trip takes place. This might be accomplished in the form of a lecture in class, or via a handout distributed beforehand. In addition, point the students towards any useful websites. This strategy gives you the advantage of working in an analytical mode while you are on the field study site, rather than being limited to describing to the students what they are seeing.
Awareness: Teach and foster a self-conscious awareness of the site. Many students may be unaware of the history, significance or background of a site that is necessary for critical consideration of the environment.
Engage: Encourage students to ask questions of guides, to interact with the site and its environment, or chat with other visitors. What, for instance, do local visitors say about the site: do they react notably differently to our group? Why?
Meta-Learning: Have students think about how what they experience at the site complicates or contradicts what they have read or discussed in class. How might they account for any such differences? How does the medium of learning affect their conclusions?
Build Upon: Leave time for discussion on site while the issues are fresh; always follow up field studies with a discussion in class once students have had time to meditate on their experiences
Illustrate: Try, where it is useful, to find new or slightly oblique ways to teach concepts. For example, a Literature and Philosophy class on theorisations of subjectivity visits a gallery specialising in contemporary British conceptual art to address the core issues of the course visually rather than textually.
Assess: Set assignments on what students learn on field studies: this will ensure students pay careful attention to what they experience

➢ 4. INQUIRY-BASED LEARNING

What is Inquiry-Based Learning?

Based on John Dewey's philosophy that education begins with the curiosity of the learner, inquiry in the classroom places the responsibility for learning on the students and encourages them to arrive at an understanding of concepts by themselves.

- Determining what they need to learn
- Identifying resources and how best to learn from them
- Using resources and reporting their learning
- Assessing their progress in learning

Students will take the initiative and be largely responsible for seeing they successfully complete their learning in a given area and achieve leraning outcomes. Generally, students draft a "learning contract"

that specifies what they will learn, the resources, and how their learning will be demonstrated and assessed. Throughout the project students then execute their learning contract with the instructor submitting a grade on completion of the contract.

Why Teach Inquiry?

Encouraging learners to be self-directed is a critical skill that students need to acquire in order to be successfulin future. This method encourages students to build relevant research skills, such as identifying learning goals and resources that are then implemented to meet deadlines.

Inquiry-Based learning Strategies

Teaching through "inquiry" involves engaging students in the research process with instructors supporting and coaching students at a level appropriate to their starting skills. Students learn discipline specific content while at the same time engaging and refining their inquiry skills. An inquiry:

- Is question driven, rather than topic or thesis driven
- Begins with a general theme to act as a starting point or trigger for learning
- Emphasizes asking good researchable questions on the theme, and coaches students in doing this
- Builds library, interview, and web search skills, along with the critical thinking skills necessary for thoughtful review of the information. Coaches students on how to best report their learning in oral or written form.
- Provides some mechanism (interviews, drafts, minutes of group meetings, bench mark activities, etc.) to help students monitor their progress within the course.
- Draws on the expertise and knowledge of the instructor to model effective inquiry and to promote reflection.

Guidelines for Creating an Inquiry-Based Class

Denise Jarrett, writer and researcher for Inquiry Strategies for Science and Mathematics Learning, indicates that inquiry-based instruction improves student attitude and achievement, facilitates student understanding, fosters critical thinking skills, and facilitates mathematical discovery. She provides guidelines for creating an inquiry-based classroom that provide students with the time, space, resources, and safety necessary for learning. These include:

- Engaging students in designing the learning environment.
- Integrating science laboratories into the regular class day
- Using inquiry in the mathematics classroom
- Employing management strategies to facilitate inquiry
- Reflecting the nature of inquiry by displaying and demanding respect for diverse ideas, abilities, and experiences; modelling and emphasizing the skills, attitudes, and values of scientific inquiry: wonder, curiosity, and respect toward nature; enables students to have a significant voice in decisions about the content and context of their work; and nurtures collaboration among students

➢ 5. LAB-BASED LEARNING

What is Lab-Based learning?

Laboratories are wonderful settings for teaching and learning different subjects. They provide students with opportunities to think about, discuss, and solve real problems.

Writing about laboratory teaching, McKeachie said:

Laboratory teaching assumes that first-hand experience in observation and manipulation of the materials is superior to other methods of developing understanding and appreciation. Laboratory training is also frequently used to develop skills necessary for more advanced study or research. (in Gage, 1962, p. 1144-1145).

Why use Lab-Based Learning?

Since late in the 19th century educators have believed that the laboratory is an important means of instruction. Laboratory instruction was considered essential because it provided training in observation, supplied detailed information, and aroused pupils' interest.

In order for labs to be effective, students need to understand not only how to do the experiment, but why the experiment is worth doing, and what purpose it serves for improving students' understanding a concept, relationship, or process.

Shulman and Tamir, in the Second Handbook of Research on Teaching (Travers, ed., 1973), listed five types of objectives that may be achieved through the use of the laboratory in science classes:

- **Skills** - manipulative, inquiry, investigative, organizational, communicative
- **Concepts** - for example, hypothesis, theoretical model, taxonomic category
- **Cognitive abilities** - critical thinking, problem solving, application, analysis, synthesis
- **Understanding of the nature of concepts-** how they work, existence of a multiplicity of learning methods, interrelationships between subject and technology and among the various disciplines
- **Attitudes** - for example, curiosity, interest, risk taking, objectivity, precision, confidence, perseverance, satisfaction, responsibility, consensus, collaboration, and liking science (1973, p.1119).

Lab-Based Teaching Strategies

Developing and teaching an effective laboratory requires as much skill, creativity, and hard work as proposing and executing a first-rate research project.

Think About the Goals.

Before you begin to develop a laboratory program, it is important to think about its goals. Here are a number of possibilities:

- Develop intuition and deepen understanding of concepts.
- Apply concepts learned in class to new situations.
- Experience basic phenomena.
- Develop critical, quantitative thinking.
- Develop experimental and data analysis skills.
- Learn to use different apparatus.
- Learn to estimate statistical errors and recognize systematic errors.
- Develop reporting skills (written and oral).

➢ 6. PROBLEM-BASED LEARNING

Any learning environment in which the problem drives the learning. (Woods, 2005)

What is Problem-Based Learning (PBL)?

Problem-based learning is based on the messy, complex problems encountered in the real world as a stimulus for learning and for integrating and organizing learned information in ways that will ensure its recall and application to future problems. Problems are raised at the start of the topic, before they have been taught some of the relevant knowledge. By actively engage with the problem, learners develop skills around finding information, identifying what information they still need and possible sources of that information. Learners are able to connect what they are learning in class to their own lives and important issues in their world.

Why PBL?

Today's world brings with it a rapid explosion of easily accessible knowledge. Today graduates need to be self directed and possess lifelong learning skills. They need to be critical thinkers, problem solvers and analytical in their approach. The inter-disciplinary nature of work means that they need to be able to integrate knowledge and skills from a number of disciplines as well as have the interpersonal skills to be an effective team member.

Problem-based learning activities are designed to develop transferable skills and attributes along with the appropriate discipline specific knowledge. Transferable skills/attributes are part of the degree level expectations that represent the intended outcomes for a university education and are being written into program curriculum. Problem-based learning challenges students to develop the ability to think critically, analyse problems, find and use appropriate learning resources.

A learner-centered educational method; Through PBL learners are progressively given more and more responsibility for their own education and become increasingly independent of the teacher for their education.

The PBL Learning Process

In PBL, learners encounter a problem and attempt to solve it with information they already possess allowing them to appreciate what they already know. They also identify what they need to learn to better understand the problem and how to resolve it.

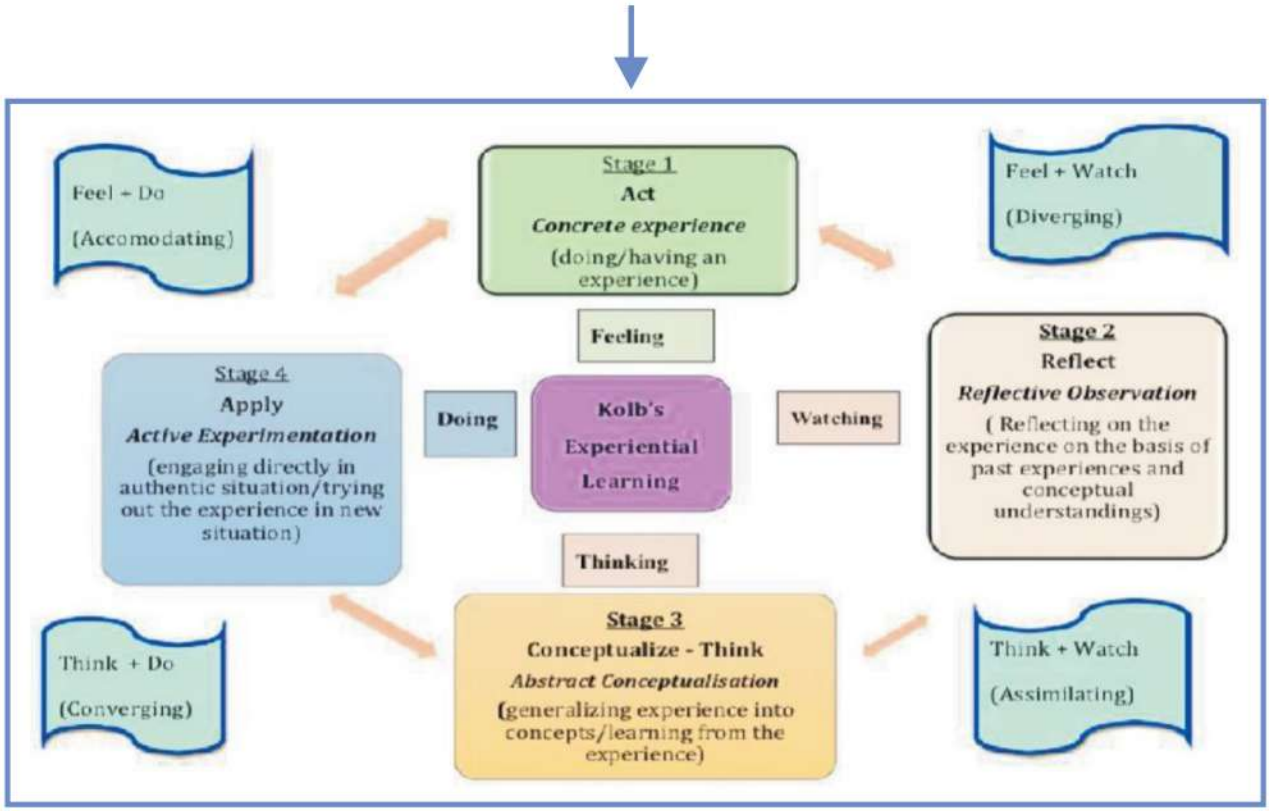
Once they have worked with the problem as far as possible and identified what they need to learn, the learners engage in self-directed study to research the information needed finding and using a variety of information resources (books, journals, reports, online information, and a variety of people with appropriate areas of expertise). In this way learning is personalized to the needs and learning styles of the individual.

The learners then return to the problem and apply what they learned to their work with the problem in order to more fully understand and resolve the problem.

After they have finished their problem work the learners assess themselves and each other to develop skills in self-assessment and the constructive assessment of peers. Self-assessment is a skill essential to effective independent learning.

The responsibility of the teacher in PBL is to provide the educational materials and guidance that facilitate learning. The principle role of the teacher in PBL is that of a facilitator or educational coach (often referred to in jargon of PBL as a "tutor") guiding the learners in the PBL process. As learners become more proficient in the PBL learning process the tutor becomes less active. **E**

➢ 7. EXPERIENTIAL LEARNING



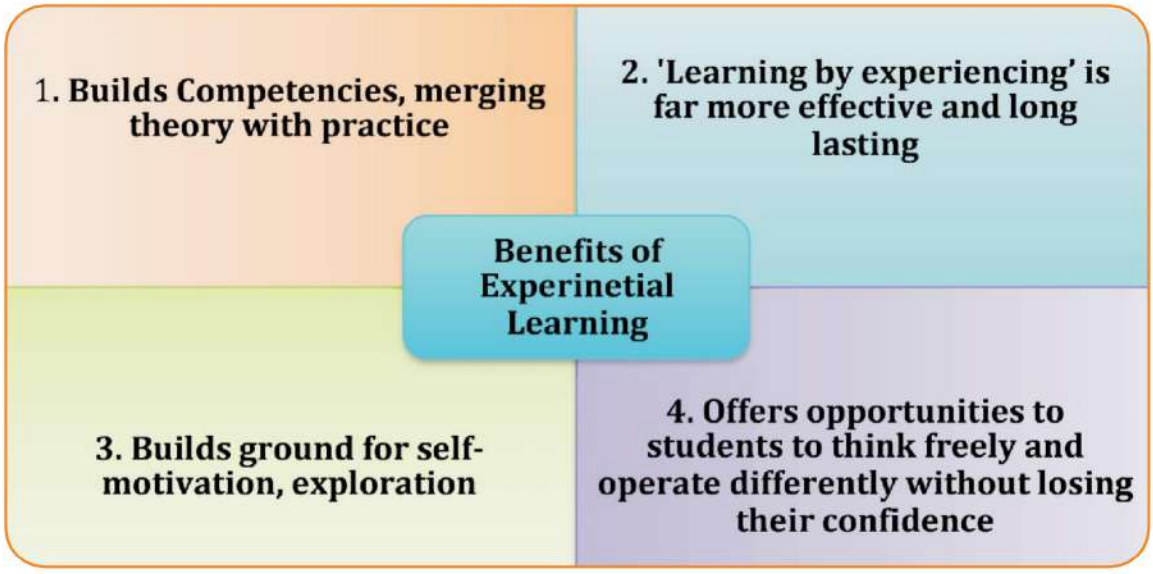
Stage 1 - Concrete Experience: The learner cannot learn merely by reading or observing. He needs to actively participate in the experience by feeling it with all the five senses. The idea is to immerse in the experience and learn.

Stage 2 -Reflective observation: This is the second stage where the learner reflects at the situation before forming any opinion. The learner must reflect upon the present by connecting it to his past experiences. Reflective observation focuses on observing and perceiving.

Stage 3 -Abstract Conceptualization: The learner creates theories to explain his experiences. In this stage the learner gathers and analyzes the information and draws conclusions. Sometimes it may challenge the pre-existing concept. This focuses on learning by thinking.

Stage 4 - Active Experimentation: This is the final stage where the learner applies what he has learnt while learning by doing.

The learner can enter a learning cycle at any stage, but must go through all thefour stages to complete his learning cycle.



➢ 8. COMMUNITY-BASED LEARNING

Community-based learning is a high impact practice which can improve student retention and engagement, and help students better absorb, retain, and transfer knowledge. Community partners can come to the classroom to present students with a real-life problem, a relevant question, or a research area related to the curriculum. Over the duration of the term, students apply what they are studying in the curriculum to analyze the problem, reflect on what they are learning, and provide potential solutions to the community partner's problem or need.

Challenges

Having students work on an authentic problem for a community partner is not without its challenges. Lenton, Sidhu, Kaur, Conrad, Kennedy, Munro and Smith (2014) outlined a number of these challenges including the following:

- Compared to more traditional course offerings, the workload is higher for students and instructors.
- Working on authentic problems may be chaotic and confusing, just as it is in the real world. Students may become frustrated with the process and higher workload, and be unclear about the learning goals when compared to more traditional courses. This can mitigated by planning the programme carefully.
- Engaging students in a reflective process is necessary to help students recognize the learning that is taking place.
- Instructors may require extra operational support to handle the details of the project. The details can range from ensuring that students have completed the necessary ethics and data sharing agreement to the time and effort required to foster the relationship with the community partner.
- It can be difficult too to complete a project within the timeframe of a term. This can be managed by planning time bound action plan.

Benefits

However, there many good reasons for taking the time to offer this type of course (see, for example, Kuh, O'Donnell & Reed, 2013; Lenton et al.; Lombardi, 2007). Working with a community partner has the benefit of bringing students into meaningful contact with future employers, customers, clients, and colleagues. Students experience higher levels of engagement and take a deeper approach to

learning when they are able to apply what they are studying to address a real-world problem. They are better able to apply theory to the specific project. They have a deeper understanding of the subject matter. They can improve critical thinking, problem solving, presentation, analytical, team work, and interpersonal skills. They can experience what it is like to work on real problems relevant to their discipline, and reflect on that learning in a safe and supporting environment.

Getting Started

Any course requires advance planning and this is especially true when designing a project where you'll be collaborating with a community partner. Project planning involves for the students to *do something well for someone other than the school instructor*.

In addition to making decisions about the content you'll cover in your subject, spend time designing a learning opportunity where both the student and the community partner benefit.

This includes:

Lining up the appropriate partner

Having an on-campus community partner has several advantages over an off-campus community partner. An on-campus partner is physically located closer to the student, making it easier to schedule in-class visits, and is more likely to be sympathetic to the structure of the academic term and course workloads. Examples of on-campus partners include individuals from the Writing and Communication Centre, Student Affairs, living learning communities, and residence life coordinators, and librarians to name a few. Some best practices:

- Ensure that the collaboration and the project benefit both the students and the community partner.
- Meet with the community partner to discuss expectations. Clearly outline what the community partner is committing to, and what you are committing to. Provide a detailed schedule of events with dates and times set well in advance.