Module for B.Ed Primary/Junior High School Programme

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IoE/MoF/TUC/GHANA CARES TRAINING AND RETRAINING PROGRAMME FOR PRIVATE SCHOOL TEACHERS

Ministry of Finance

Trade Union Congress

Institute of Education, UCC

EBS323 METHODS OF TEACHING PRIMARY SCHOOL SCIENCE

Outline

- What is science?
- Process of science
- Product of science
- Limitations of science
- Pedagogical implications
- Importance of science
- Characteristics of scientific knowledge
- Scientific attitudes, traits and values
- Branches of science

What is Science?

- Scientia means knowledge
- Science is a body of knowledge obtained by methods based on observations
- A method of exploring the environment by observing things and solving problems
- The gathering and recording of information to find answers to questions and challenges of human race (that humans face everyday)
- A method of obtaining knowledge through observation and experimentation

What is Science?

- A process of knowledge generation
- Science is the study of the physical universe by means of reproducible, observation, measurement and experimentation to establish, verify or modify natural laws to explain its nature and behavior
- Science generally is regarded in three main ways as :
  - A body of knowledge
  - A method for acquiring knowledge or studying and understanding the world
  - An institution

What is Science?

Science as a body of knowledge

- The bodies of knowledge generally regarded as science include, chemistry, biology, physics, mathematics, microbiology, pharmacy and medicine

What is Science?

Science as a method for acquiring knowledge

- Science has well-known procedures for obtaining knowledge.
- The two branches of science, which are empirical and formal sciences, use what is called the scientific method

What is Science?

Scientific method

- Scientific methods are procedures used by scientists to solve problems.
- The steps to follow are
  - Recognize a problem
  - Collecting information about the problem
  - Hypothesis formulation
  - Devise an experiment
  - Observing and recording results
  - Analyzing results (making deductions)
  - Drawing conclusions and generalizations (theory formulation)

What is Science?

Scientific method

Theory formulation

- A scientific theory is an explanation about the cause or causes of a broad range of related phenomena.
- Theory explains how things are related or their common properties.
- Theories take various forms, which may be as diagrams, equations, statistical and prepositional formulations.
- A theory is formulated in such a way that its range of application is indicated.

What is Science?

Scientific method

Theory formulation

- Every good theory has a predictive value.
- Theories enable us to explain, predict and control phenomenon.
- They also provide us with a new way of looking at a familiar object or phenomena
- Scientific theories include the theory of universal gravitation, the theory of evolution by natural selection, atomic theory, relativity theory, quantum theory, etc.

What is Science?

Scientific method

Theory formulation

- It differs from a scientific hypothesis in its breadth of application
- A theory is usually proposed when a hypothesis has been supported by really convincing evidence. This evidence must be obtainable in many different laboratories and by many independent researchers.
- Theories are open to tests, revisions, and tentative acceptance or rejection.

What is Science?

Scientific method

Theory formulation

- As soon as new information is observed in the course of applying the theory, such existing or established theory is revised. Thus, a new theory emerges to replace the existing one. This is a guarantee for the development of science and human knowledge.
- Old theories do not become incorrect but merely become obsolete

What is Science?

Scientific method

Theory formulation

- A good theory has a predictive value. It prophesies certain results. But scientific prophecy does not say that something will certainly happen, but says only that something is likely to happen with a stated degree of probability.
- Theories that have proved to be so universally valid or true, that is, they are true anywhere in the world and have such a high degree of probability, are called natural laws. That means that not all theories are laws

What is Science?

Scientific method

Theory formulation

Examples of laws of nature are:

- 1. Law of the uniformity of nature
- 2. Law of causation
- 3. The law of gravitation
- 4. The law of natural selection

What is Science?

Scientific method

- Scientific Method provide logical procedures for arriving at knowledge
- It provides knowledge that can be verified
- It is also used to solve problems in our environment

What is Science?

Science as an institution

- Science can be viewed as an institution which comprises millions of experts.
- These experts engage in the study and development of human knowledge.
- The experts or scientists can be found in various research and educational institutions, industries, hospitals, companies, etc.
- The cooperation and interaction among them make the development of science possible and reliable.

Definition of Science

- Exploring the environment, observing things and solving problems
- A group of laws based on observation and proved correct by experiments
- The body of knowledge which can be communicated to others and which can be verified by anyone willing to make the effort to do so
- Science is way of learning that involves firsthand experiences, inquiry, problem solving, interpretation and communication of findings
- Science is a process of generating knowledge and a search for explanation
- Science is both a process and a product

Process of Science

- The processes of science are the procedures used by scientists. These are the practices employed in science to uncover knowledge and interpret the meaning of those discoveries.

Process Skills

- They are a set of abilities appropriate to many science disciplines that reflect the behavior of scientists. Process skills are grouped into two types. These are basic and integrated process skills. The basic (simpler) process skills provide a foundation for learning the integrated (more complex) skills. These skills are listed and described below.

Process of Science

Basic Process Skills

Observing

- Using the senses to gather information about an object or event. Example: Describing a pencil as yellow.

Inferring

- Deduce or conclude (something) from evidence and reasoning rather than from explicit statements
- Making an "educated guess" about an object or event based on previously gathered data or information. Example: Saying that the person who used a pencil made a lot of mistakes because the eraser was well worn
- Explaining an observation in terms of one’s previous experience.

Process of Science

Basic Process Skills

Measuring

- Using measuring instruments to describe the dimensions of an object or event. Example: Using a meter stick to measure the length of a table in centimeters.
- Using measuring instruments correctly and with appropriate precision as required by the investigation, and being able to compute result from measurements taken.
- The accurate use of measuring instruments and equipment for measuring, reading and making observations.

Process of Science

Basic Process Skills

<u>Communicating</u>

- Using words or graphic symbols to describe an action, object or event. Example: Describing the change in height of a plant over time in writing or through a graph.
  Being able to present information so that it can be understood by others, being able to understand information from others presented in various forms using graphs, charts, written instruction, diagrams, pictorial and oral representation

Process of Science

Basic Process Skills

Classifying

- Arrange (a group of people or things) in classes according to shared qualities or characteristics.
- Group specimens and objects according to their common properties or characteristics.
- Grouping or ordering objects or events into classes based on properties or criteria. Example: Placing all rocks having certain grain size or hardness into one group.
  Placing a collection of objects or events in classes based on similar characteristics.

Process of Science

Basic Process Skills

Predicting

- Stating the outcome of a future event based on a pattern of evidence. Example: Predicting the height of a plant in two weeks time based on a graph of its growth during the previous four weeks.
- Forecasting what future observation will be on the basis of previous information, which distinguishes it from guessing.
- Say or estimate that (a specific thing) will happen in future or will be a consequence of something

Process of Science

Basic Process Skills

Drawing

- Draw clearly and label specimens, objects etc.

Recording

- Set down in writing or some other permanent form for later reference.
- Draw or make graphical representation boldly and clearly, well labeled and pertinent to the issue at hand.

Calculating

- Determine (the amount or number of something) mathematically.

Process of Science

Basic Process Skills

Manipulating

- Manipulation involves the skillful handling of scientific objects and tools for accomplishing specific tasks. It involves setting up laboratory apparatus, preparing specimens and other material for observation.

Process of Science

Basic Process Skills

<u>Activity</u>

Explain the following process skills.

1. Using numbers

1. Using space/time relationship

Process of Science

Integrated Process Skills

Controlling variables

- Being able to identify variables that can affect an experimental outcome, keeping most constant while manipulating only the independent variable. Example: Realizing through past experiences that amount of light and water need to be controlled when testing to see how the addition of organic matter affects the growth of beans.

Process of Science

Integrated Process Skills

Defining operationally

- Stating how to measure a variable in an experiment. Example: Stating that bean growth will be measured in centimeters per week

Formulating hypotheses

- Stating the expected outcome of an experiment. Example: The greater the amount of organic matter added to the soil, the greater the bean growth.
- Suggesting reasons for events or phenomena, which can be tested scientifically. It involves applying concepts and ideas from previous experience.

Process of Science

Integrated Process Skills

Interpreting data

- Giving meaning to information gathered.
- Explain the meaning of information or actions
- Example: Recording data from an experiment on bean growth in a data table and giving explanation which relates trends in the data to variables.

Process of Science

Integrated Process Skills

Experimenting

- Being able to conduct an experiment, including asking an appropriate question, stating a hypothesis, identifying and controlling variables, operationally defining those variables, designing a "fair" experiment, conducting the experiment, and interpreting the results of the experiment. Example: The entire process of conducting the experiment on the effect of organic matter on the growth of bean plants
- Interaction with materials to find out things for yourself or managing the factors that may influence a situation or event so that the effect of a given factor may be learned.

Process of Science

Integrated Process Skills

Formulating models

- Creating a mental or physical model of a process or event. Examples: The model of how the processes of evaporation and condensation interrelate in the water cycle.

Process of Science

Integrated Process Skills

Activity

Explain the following process skills.

1. Raising questions
2. Designing/Planning
3. Drawing conclusions

Product of Science

- The procedure you use to arrive at a conclusion is referred to as Process of Science. The scientist ends up an investigation or research by making discoveries of facts and concepts, formulating generalizations, theories and laws. These are known as ‘Products of Science’. Examples are facts drawn from experiments, theories such as Atomic Theory and Mendel’s Theory, law such as law of gravity, law of conservation of water, law of floatation, and principles such as Archimedes’ principles.

Limitations of Science

- Practice of science is a human activity
- Anything outside the sense is not science
  - anything beyond the boundary of senses
  - no spiritual things in science
- There is an authority in science and when that authority speaks then that is the end of it (observation)
  - truth being relative
  - one truth being replaced by another truth
- There is a building up on this observation
- Methods of science are based on observation but not limited to it.
- From observation there are generalizations based on explanations and these are further tested by observation (building up process)

Pedagogical implications

- Learners should not be made to imagine things during instruction. They should make their own observations in class.
- Teachers should create an environment to allow learners to handle, measure, see, experiment, observe, analyze, etc. things.
- Equipment to be used must be made available to students
- Teaching should be more practical than theoretical
- Theoretical things must be supported by practical bases
- Teachers should avoid copying notes on the blackboard for students but rather teach students to understand concepts
- Teachers should use examples in everyday life experiences and relate them to the topic to enhance learners' understanding of lesson content.

Pedagogical implications

- Teachers should encourage field trips for students to familiarize themselves with things that they cannot have a feel of in their laboratories
- Teachers should use teaching devices to enhance learners' understanding of concepts.
- Learners should accurately apply appropriate science concept, principles, laws and theories in interacting with the universe.
- Learners should use processes in science in solving problems, making decision and furthering their own understanding of the universe.

Pedagogical implications

- Learners should interact with the various aspects of the universe in way that is consistent with the values that underline science.
- Learners should develop scientific attitudes such as scientific objectivity, open mindedness, curiosity, perseverance, flexibility, respect for evidence, reflection, honesty, critical mindedness, thoroughness.
- Learners should be familiar with some values in science and how they contribute to the development of science. Some values in science includes: longing to know and understand, questioning of all things, request for logic, consideration of premises, respect diversity, equity commitment to achieve excellence, team work/collaboration, truth and integrity.

Importance of Science

- Science is important to the public because it helps address issues that are concern to the general population.
- Scientific principles have been and continue to be applied to address issues, concerns and problems that people face in the day to day aspects of living.
- Scientific research has value and importance to the layperson to the extent that it helps address problems of a practical nature.
- How science is taught and learned can determine its relevance to the majority of students, not only to those planning career in scientific fields.

Importance of Science

- Science helps humans to explain how the world, events and objects around them originate, develop, operate or function.
- It also helps humans to predict how they will behave in future and thus enables them to control the behaviour of the things around them
- Science equips humans with theoretical knowledge about the world. Such knowledge is usually summarized using concepts, laws and theories. These help us to express and systematize our understanding of objects and phenomena.
- Science also equips us with practical knowledge in terms of the various ways, mechanisms and instruments which enable us to control objects and phenomena.
- Science is not only a source of knowledge; it is also a source of power.

Characteristics of Scientific Knowledge

Tentative

- It is subject to change and therefore does not claim to be the truth in an absolute and final sense.

Public

- It is based on evidence that is public as opposed to personal.

Replicable

- It is based on evidence which at least in theory could be obtained by other investigators working in a different place and at a different time given similar conditions.

Characteristics of Scientific Knowledge

Historic

- Scientific knowledge of the past has provided the basis for today's knowledge which in turn will provide the basis for tomorrow's knowledge.

Humanistic

- It is the product of mankind resulting from an effort to impose order on nature or find patterns in nature and involves creative imaginations.

Characteristics of Scientific Knowledge

Unique

- Scientific knowledge is distinguished from other realms of knowledge by virtue of the nature of its knowledge and its procedures for generating new knowledge.

Empirical

- Based on or verifiable by observation or experiment rather than theory or pure logic
- Scientific knowledge is based ultimately on and/or derived from observation or experiment/practical experience even though theory may be a useful guide to further work. It has its origin in the real world and is dependent on sense experience.

Characteristics of Scientific Knowledge

Precision

- Scientific knowledge is precise. It is not vague like some literary writing. “Every moment dies a man; every moment one is born”, is good literature but not science. To be a good science, it should be written as: “In India, according to the 2001 census, every 10th second, on the average, dies a man; every 4th second, on the average, an infant is born.” Precision requires giving exact number or measurement. Instead of saying “most of the people are against same sex marriages,” a scientific researcher says, “Ninety per cent people are against same sex marriages”.

Characteristics of Scientific Knowledge

Verifiable

- Scientific knowledge is based on verifiable evidence (concrete factual observations) so that other observers can observe, weigh or measure the same phenomena and check out observation for accuracy. Science does not have answers for everything. It deals with only those questions about which verifiable evidence can be found.

Systemic Exploration

- A scientific research adopts a certain sequential procedure, an organized plan or design of research for collecting and analysis of facts about the problem under study.

Characteristics of Scientific Knowledge

Accuracy

- Scientific knowledge is accurate. A physician, like a common man, will not say that the patient has slight temperature or having very high temperature but after measuring with the help of thermometer, he will pronounce that the patient is having 39^0 C temperature. Accuracy simply means truth or correctness of a statement or describing things in exact words as they are without jumping to unwarranted conclusions.

Characteristics of Scientific Knowledge

Objectivity

- Objectivity means the ability to see and accept facts as they are, not as one might wish them to be. To be objective, one has to guard against his own biases, beliefs, wishes, values and preferences. Objectivity demands that one must set aside all sorts of the subjective considerations and prejudices.

Reliability

- Scientific knowledge must occur under the prescribed circumstances not once but repeatedly. It is reproducible under the circumstances stated anywhere and anytime. Conclusions based on casual recollections are not very reliable

Characteristics of Scientific Knowledge

Ethical Neutrality

- Science is ethically neutral. It only seeks knowledge. How this knowledge is to be used, is determined by societal values. Knowledge can be put to differing uses. Knowledge about atomic energy can be used to cure diseases or to wage atomic warfare. Ethical neutrality does not mean that the scientist has no values. It only means that he must not allow his values to distort the design and conduct of his research. Thus, scientific knowledge is value-neutral or value-free.

Scientific traits, attitudes and values

- Class discussion
- Use the science curriculum

Branches of Science

- Formal versus empirical
- Natural versus social

Branches of Science

Formal sciences

- Formal science utilizes concepts, rules and theories, and expresses them in a quantitative and statistical manner
- include mathematics (which comprise geometry, algebra, trigonometry, arithmetic), logic, theoretical physics, and statistics
- Science is said to be formal if its contents, arguments and procedures obey certain rules

Branches of Science

Formal sciences

- The result and conclusions of such sciences are valid and authentic only if they conform to those rules
- For example, in mathematics there are rules of addition, subtraction, multiplication and division
- There are also rules for solving certain equations and problems, theorems, etc.

Branches of Science

Empirical sciences

- include physics, chemistry, biology, psychology, botany, zoology, biochemistry, microbiology, geology, medical sciences, etc
- These study objects and phenomena which can be observed through any of the senses and which can be tested with instruments such as the telescope, microscope, ruler, tapes and scales
- In other words, anything that cannot be observed with the senses of sight, touch, hearing, taste and smell or with instruments such as ruler, telescope, etc. is outside science

Branches of Science

Empirical sciences

- empirical scientists observe and experiment in order to find out how things originate, grow or develop, function and relate to each other.
- Knowledge must be based on observable phenomena and must be capable of being verified by other researchers working under the same conditions (e.g., natural and social sciences)

Branches of Science

Empirical sciences

- They also try to find out the laws which govern their behavior
- They are interested in laws, which enable them to understand or explain the objects or phenomena under study
- The knowledge derived in empirical sciences includes inductive generalisations, laws and theories.

Branches of Science

Natural Sciences

- Natural sciences deal with all natural objects
- Study of natural phenomena (e.g., physical, chemical and biological factors of the universe)
- Natural science is divided into two main branches, that is, physical and life sciences

Branches of Science

Natural Sciences

- Physical sciences
  - deals with physical and inanimate objects such as rocks, rivers, and mountains
  - Physics
  - Chemistry
  - Geology
  - Applied mathematics
  - Astronomy

Branches of Science

Natural Sciences

- Biological sciences
  - deals with living bodies such as human beings, animals, insects and plants
  - Biology
  - Zoology
  - Botany
  - Microbiology

Branches of Science

Natural Sciences

- Medical sciences
  - deals with objects and problems that affect human and animal health
  - general medicine
  - anatomy
  - surgery
  - physiology
  - veterinary medicine

Branches of Science

Natural Sciences

- Pharmaceutical sciences
  - disciplines are concerned with drugs and drug contents of plants and other objects
  - Pharmaceutics
  - Pharmaceutical chemistry
  - Pharmacognosy
  - Pharmacology

Branches of Science

Social Science

- These deal with society and social institutions.
- Study of human behaviour in its social and cultural aspects
- Disciplines under it are
  - Economics
  - Social psychology
  - Geography
  - Sociology and anthropology
  - Social philosophy, etc.

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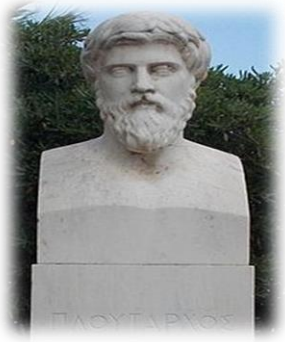
UNIT 2

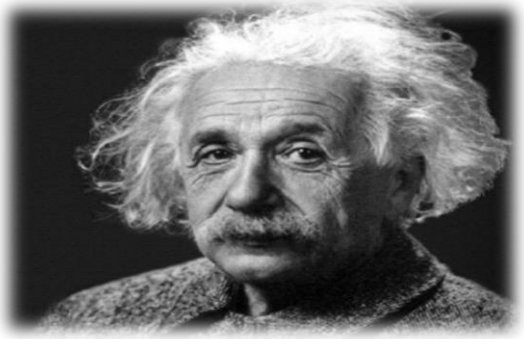
Views on Education

”The most important attitude that can be formed is that of desire to go on learning” **(Dewey, 1963, p.48)**

The mind is not a vessel that needs filling, but wood that needs igniting
Plutarch AD 46 - AD 120



“*Education is not the learning of facts but the training of mind to think*“
Albert Einstein 1879 - 1955



Outline

- What is teaching?
- Teaching as a science and an art
- Teaching competencies
- Roles of the teacher in the teaching and learning process
- Three main phases of teaching

What is teaching?

- Teaching is the process of carrying out activities that provide students with experiences that can induce learning.
- It is an activity that leads to acquisition of experience by learners that leads to and affective development
- It is an activity that leads to the acquisition of knowledge by learners that leads to intellectual development
- It is an activity that leads to the acquisition of knowledge, skills attitude and values by learners.
- It involves creating situations to facilitate learning and motivating learners to have interest in what is being acquired

What is teaching?

- Teaching is the art of facilitating the acquisition of knowledge (intellectual development) by learners.
- Teaching is the art of facilitating the acquisition of experience (affective development) by learners.
- Teaching is the art of facilitating the acquisition of knowledge, skills, attitude and values by learners.

What is teaching?

- Hunter (1984) defines teaching as the constant stream of professional decisions that affects the probability of learning: decisions that are made and implemented before, during and after interaction with the students".
- Farrant (1980) defines teaching as "a process that facilities learning".
- Teaching is the activity that translates curriculum goals and objectives into experiences that students acquire during their interaction with the teacher.

What is teaching?

- According to Beach and Reinhartz (1989), teaching is a complex and multidimensional activity. It includes:
  - telling
  - explaining
  - defining
  - giving examples
  - stressing critical attributes
  - modelling
  - demonstrating.

Teaching as an art

- Teacher are born
- Some people teach naturally and effectively as if they have been trained
- Some untrained teachers in Primary Schools, and Junior High Schools in Ghana have been known to be effective in their teaching.
- ***Teaching as an art*** depends on the individual teacher and his personality

Teaching as an art

- The art of teaching has been undertaken by people of different walks of life and various organizations from ancient times to the present.
- Some of the people included Socrates, Plato, Aristotle,
- It also includes various religious organizations like Taoism, Zoroastrianism, Buddhism, Christianity and Islam.
- These organization were exemplified by their leaders, notably among whom were Confucius, Zoroaster, Gautama (the Buddha), Jesus Christ and Mohammed.
- Other teachers of great repute included Herbart, Rousseau, Comenius, Pestalozzi, John Locke, Montessori and John Dewey.

Teaching as a science

- Modern teaching is considered a science
- It does not leave things to chance as in the case of teaching as an art.
- Teaching as a science is a body of systematized knowledge on teaching methodology, human development, human learning or educational psychology.
- Such knowledge is derived from scientific investigations and built into models and theories.
- Researchers try out different teaching methods to find out their effectiveness for recommendation for classroom teachers.

Who is a teacher?

- A person who facilitates learning
- A person who guides student to acquire knowledge, skills and attitudes
- One whose professional or occupational function is to help others learn and develop new ways
- The teacher need to facilitate intellectual, personal and social development of students
- To be able to perform these functions the teacher must be well equipped to teach

What is an effective teacher?

- A person who is able to bring out intended learning outcomes
- There are two critical dimensions in effective teaching;

  (a) Intent (purpose, goal, objective, intention, target)

  (b) Achievement (something successfully finished through skill and hard work)
- An effective teacher is one who can demonstrate the ability to bring about intended learning outcomes

Qualities of a good teacher

Good teachers

- are strong communicators
- listen well
- focus on collaboration
- are adaptable
- are engaging
- show empathy
- have patience

Qualities of a good teacher

Good teachers

- value real-world learning
- share best practices
- are lifelong learners
- are life wide learners
- design learning opportunities that allow students to participate in empowering activities in which they understand that learning is a process and mistakes are a natural part of the learning

Qualities of a good teacher

Good teachers

- effectively incorporates 21st Century Learning Skills that prepare students to meet future challenges
- work with other teachers to make connections between and among disciplines
- make lesson connections to community, society, and current events
- instruct the complex processes, concepts and principles using differentiated strategies that make instruction accessible to all students

Qualities of a good teacher

Good teachers

- scaffold instruction to help students reason and develop problem-solving strategies
- orchestrate effective classroom discussions, questioning, and learning tasks that promote higher-order thinking skills
- provide meaningful learning opportunities for students
- challenges students to think deeply about problems and encourage/model a variety of approaches to a solution
- constantly develop his/her knowledge of practice in ways that allow him/her to see into teaching and learning with new eyes

Qualities of a good teacher

Good teachers

- integrate a variety of learning resources with classroom instruction to increase learning options
- view of teaching is complex (that is, completely understands the complex relationships between teaching and learning)
- know a lot about how students learn
- understand the complex relationship between teaching and learning
- Moves beyond simple delivery of information to teaching for understanding (that is, moving from teaching as telling to teaching for understanding)

Qualities of a good teacher

Good teachers

- know science content as well as having accumulated a large repertoire of teaching strategies and hands-on, minds-on and hearts-on activities
- approach teaching science in ways that draw on notions of acknowledging and responding to students' prior views and purposefully addressing alternative conceptions.
- set out to 'teach in ways that would better facilitate students' better understanding of science concepts
- foster students' responsibility for their own learning

Qualities of a good teacher

Good teachers

- work from the position that science is a social process and that science ideas change over time
- create circumstances in which there is engagement with the task, concentration, active student involvement, and increased interest.
- shift teaching from doing all the work for the students to the students now working out part of the content for themselves.
- provide students with meaningful opportunities to think
- find ways of encouraging students to accept more responsibility for their own learning.

Questions for thought

1. What does it take to be a good teacher?
2. How can I use my training to be a good chemistry teacher?
3. Where can I get some information about good chemistry teaching?
4. What things should I begin with to be a good chemistry teacher?
5. What should I do to be happy as a chemistry teacher?

Teaching Competencies

- Teaching competencies are the skills and knowledge that enable a teacher to be successful.
- To maximize student learning, teachers must have expertise in a wide-ranging array of competencies in an especially complex environment where hundreds of critical decisions are required each day (Jackson, 1990).
- Few jobs demand the integration of professional judgment and the proficient use of evidence-based competencies as does teaching.

Teaching Competencies

- An examination of research on education practices that make a difference shows that four classes of teaching competencies yield the greatest results.
    1. Instructional delivery
    2. Classroom management
    3. Formative assessment
    4. Personal competencies (soft skills)

Teaching Competencies

Instructional delivery

- Teacher has command of knowledge in the subject to be taught
- Teacher selects age appropriate lesson content.
- Teacher sets criteria for success and informs students ahead of the lesson.
- Teacher demonstrates to the students' successful use of the knowledge, skills and values through modeling.
- Teacher evaluates student acquisition of lesson content.
- Teacher provides remedial opportunities for acquiring the knowledge, skills and values, if necessary.
- Teacher provides appropriate closure at the end of the lesson.

Teaching Competencies

Instructional delivery

- Display attitudes that foster learning and genuine human relationship /Teacher must understand himself and the students

  - Teacher attitudes towards themselves

✓ should be able to cope with own emotions and the feelings/emotions of others

✓ learn to handle his own feelings

✓ recognize and understand own feelings

✓ be able to empathize with students

✓ be emotionally stable and emotionally intelligent

Teaching Competencies

Instructional delivery

- Display attitudes that foster learning and genuine human relationship /Teacher must understand himself and the students

  - Teacher attitudes towards students

✓ strong dislike or like of particular students

✓ biases towards or against a particular group, i.e. religion or tribe

✓ biases for or against certain kind of student behaviour

- Teacher attitudes towards subject matter (enthusiasm – strong feeling of interest and understanding)

Teaching Competencies

Instructional delivery

- Teacher has control of technical skills of teaching that facilitates student learning (e.g. possess a repertoire of teaching skills and is resourceful)
- Teacher must be eloquent (can communicate well)
- Teacher has command of theoretical knowledge about learning (psychology of human behavior)
  - Will be able to explain certain things that go on in the classroom
  - Will be able to notice certain things that have gone unnoticed
  - Deals with students in an appropriate way

Teaching Competencies

Classroom Management

- **Rules and procedures**

Effective rules and procedures identify expectations and appropriate behaviour for students. To be effective, these practices must be observable and measurable.

- **School wide rules and procedures**

Clearly stated rules identify, define, and operationalize acceptable behaviour specific to a school. These rules, applicable to all students, are designed to build pro-social behavior and reduce problem behavior in a school. They distinguish appropriate behaviour from problem behavior as well as specify consequences for infractions.

Teaching Competencies

Classroom Management

- **Classroom rules and procedures:**

  Another set of clearly stated rules establishes acceptable behaviour specific in a classroom. These rules need to be consistent with school wide rules, but may be unique to meet the needs of an individual classroom.

Teaching Competencies

Classroom Management

❑ **Proactive classroom management**:

- These are the practices that teachers and administrators can employ to teach and build acceptable behavior that is positive and helpful, promotes social acceptance, and leads to greater success in school.
- The key to proactive classroom management is active teacher supervision.
- The practice elements that constitute active supervision require staff to observe and interact with students regularly.
- The goal is to build a positive teacher-student relationship by providing timely and frequent positive feedback for appropriate behaviour, and to swiftly and consistently respond to inappropriate behaviours.

Teaching Competencies

Classroom Management

❑ **Effective classroom instruction**:

- The key to maintaining a desirable classroom climate is to provide students with quality instructional delivery aligned to the skill level of each student.
- This enables students to experience success and keeps them attentive.

❑ **Behaviour reduction**

- These practices, designed to reduce problem and unacceptable behaviour, are employed in the event the first three strategies fail.
- Behaviour reduction strategies include giving students corrective feedback at the time of an infraction, minimizing reinforcement of a student's unacceptable behaviour, and guiding students in how to behave appropriately.

Teaching Competencies

Formative Evaluation

- Effective ongoing assessment, referred to in education literature as formative assessment and progress monitoring, is indispensable in promoting teacher and student success.
- It is frequently listed at the top of interventions for school improvement.
- Feedback, a core component of formative assessment, is recognized as an essential tool for improving performance in sports, business, and education.
- Feedback has been identified as the single most powerful educational tool available for improving student performance.

Teaching Competencies

Formative Evaluation

- Formative assessment consists of a range of formal and informal diagnostic testing procedures, conducted by teachers throughout the learning process, for modifying teaching and adapting activities to improve student attainment.
- Systemic interventions depend heavily on the use of formative assessment.

Teaching Competencies

Personal competencies (soft skills):

- These skills must be defined as clear behaviours that teachers can master for use in classrooms.
- Indispensable soft skills include:
  1. Establishing high but achievable expectations
  2. Encouraging a love for learning
  3. Listening to others
  4. Being flexible and capable of adjusting to novel situations
  5. Showing empathy

Teaching Competencies

Personal competencies (soft skills):

6. Being culturally and gender sensitive
7. Embedding and encouraging higher order thinking along with teaching foundation skills
8. Having a positive regard for students.

Roles of the Teacher in the Teaching and Learning Process

- Teachers are facilitators of student learning and creators of productive classroom environments, in which students can develop the skills they might need at present or in future.
- Most teachers take on a variety of roles within the classroom.
- The primary role of a teacher is to deliver classroom instruction that helps students learn.
- To accomplish this, teachers must prepare effective lessons, grade student work and offer feedback, manage classroom materials, productively navigate the curriculum, and collaborate with other staff.

Roles of the Teacher in the Teaching and Learning Process

<u>Teacher Roles</u>

- Facilitator
- Prompter
- Resource
- Assessor
- Organizer
- Participant
- Interpreter and designer of learning programmes and materials
- Leader, administrator and manager
- Scholar, researcher, lifelong and life wide learner
- Community, citizenship and pastoral role

Roles of the Teacher in the Teaching and Learning Process

Facilitator

- Guides what students do in class
- Makes learning activities easier for students
- Ensures that students are actively engaged in classroom activities
- Inspire students through their own knowledge and expertise

Roles of the Teacher in the Teaching and Learning Process

Prompter

- The teacher encourages students to participate and makes suggestions about how students may proceed in an activity.
- The teacher helps students only when necessary.
- When learners are literally ‘lost for words’, the prompter can encourage by discreetly nudging students.
- Students can sometimes lose the thread or become unsure how to proceed; the prompter in this regard can prompt but always in a supportive way

Roles of the Teacher in the Teaching and Learning Process

Resource

- The teacher is a kind of walking resource center ready to offer help if needed
- The teacher must make her/himself available so that learners can consult her/him when (and only when) it is absolutely necessary.
- As a resource the teacher can guide learners to use available resources such as the internet

Roles of the Teacher in the Teaching and Learning Process

Assessor

- The teacher assumes this role to see how well students are performing or how well they performed.
- Feedback and correction are organized and carried out.
- The role of an assessor gives teachers an opportunity to correct learners.
- As an assessor, the teacher does not merely evaluate the success of students to achieve the goals in the teaching and learning process, but also becomes an evaluation for the success of the teacher in the implementation of teaching and learning process.

Roles of the Teacher in the Teaching and Learning Process

Organizer

- The success of many activities depends on good organization and on the students knowing exactly what they are to do next.
- Giving instructions is vital in this role as well as setting up activities.
- The organizer can also serve as a demonstrator, this role also allows a teacher to get involved and engaged with learners.
- The teacher also serves to open and neatly close activities and also give content feedback.

Roles of the Teacher in the Teaching and Learning Process

Participant/Partner

- This role improves the atmosphere in the class when the teacher takes part in an activity.
- The teacher becomes a co-learner
- The teacher can enliven a class; if s/he is able to stand back and not become the center of attention, it can be a great way to interact with learners without being too overpowering

Roles of the Teacher in the Teaching and Learning Process

Interpreter and designer of learning programmes and materials

- The teacher will understand and interpret learning programmes, design original learning programmes, identify the requirements for a specific context of learning and select and prepare suitable textual and visual resources for learning.
- The teacher will also select, sequence and pace the learning in a manner sensitive to the differing needs of the subject learning area and learners.

Roles of the Teacher in the Teaching and Learning Process

Leader, administrator and manager

- The teacher will make decisions appropriate to the level, manage learning in the classroom, carry out classroom administrative duties efficiently and participate in school decision making structures.
- These competences will be performed in ways which are democratic, which support learners and colleagues, and which demonstrate responsiveness to changing circumstances and needs

Roles of the Teacher in the Teaching and Learning Process

Scholar, researcher, lifelong and life wide learner

- The teacher will achieve ongoing personal, academic, occupational and professional growth through pursuing reflective study and research in their learning area, in broader professional and educational matters, and in other related fields.

Roles of the Teacher in the Teaching and Learning Process

Community, citizenship and pastoral role

- The teacher will practice and promote a critical, committed and ethical attitude towards developing a sense of respect and responsibility towards others.
- The teacher will uphold the constitution and promote democratic values and practices in schools and society.
- Within the school, the teacher will demonstrate an ability to develop a supportive and empowering environment for the learner and respond to the educational and other needs of learners and fellow educators.

Roles of the Teacher in the Teaching and Learning Process

Community, citizenship and pastoral role

- The teacher will develop supportive relations with parents and other key persons and organizations based on a critical understanding of community and environmental development issues.

Phases of Teaching

- Teaching is a complex task.
- For performing this task, a systematic planning is needed.
- Teaching is to be considered in terms of various steps and the different steps constituting the process are called the phases of teaching.
- Teaching can be divided into three phases (i.e., pre-instructional phase, instructional phase and post-instructional phase)
- Each phase has some operations of teaching which create the situation for learning.

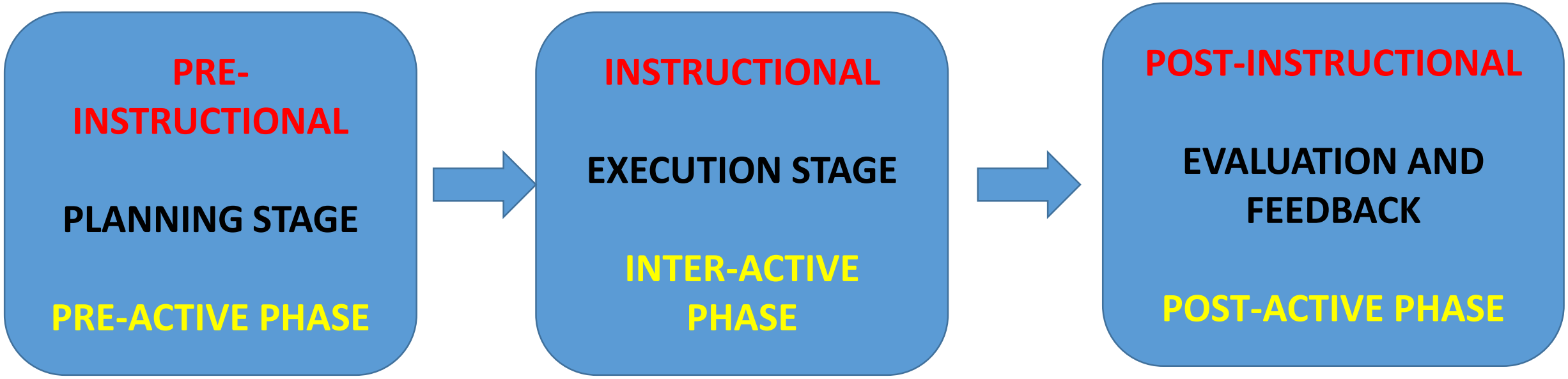
Phases of Teaching

1. Pre-active phase – refers to planning. (pre-instructional phase)

2. Interactive phase – refers to lesson presentation.(instructional phase)

3. Post-active phase – refers to the follow-up activities after the lesson. (post-instructional phase)

Phases of Teaching



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Phases of Teaching

The Pre-Active Phase of Teaching

- It is the phase of planning for teaching.
- Good planning makes the task of teacher smooth, functional and successful.
- There are two major steps involved in this phase.
    1. Establishment of instructional objectives.
    2. Discovering ways and means to realize these objectives.

Phases of Teaching

The Pre-Active Phase of Teaching

<u>Operation of teaching at pre-active phase</u>

- Before classroom teaching, a teacher has to perform many tasks.
- This phase includes all the activities which a teacher performs before entering the classroom.
- The stage involves the following activities.

Phases of Teaching

The Pre-Active Phase of Teaching

Operation of teaching at pre-active phase

- The formulation or fixing up of goal
- Selection of content or subject matter to be taught
- The arrangement of ideas
- Selecting instructional methodology
- Development of teaching strategies
- Deciding the duration, place, and management of classroom teaching
- A decision about evaluation tools and techniques

Phases of Teaching

The Pre-Active Phase of Teaching

Operation of teaching at pre-active phase

The formulation or fixing up of goal

- The teacher formulates in detail the instructional objectives in behavioral terms by using the taxonomy of educational objectives.
- Objectives are determined according to the psychology of students and needs of the society and the school.
- Objectives are determined according to what changes teacher expects in students by achieving these objectives.

Phases of Teaching

The Pre-Active Phase of Teaching

Operation of teaching at pre-active phase

Selection of content or subject matter to be taught

- After formulating instructional objectives the teacher decides on the content to be presented to the learners.
- For content selection, the following points should be kept in mind.
    1. The demand of syllabus/curriculum.
    2. The entry behaviour of the accepted learners.
    3. Level of motivation of learners.
    4. Appropriate assessment strategies related to the content

Phases of Teaching

The Pre-Active Phase of Teaching

Operation of teaching at pre-active phase

The arrangement of ideas

- After selecting the presentable content, the teacher arranges the elements of the content in a logical and psychological sequence.
- Sequencing of content could be from simple to complex, known to unknown, parts to whole, spiralled, etc.

Phases of Teaching

The Pre-Active Phase of Teaching:-

<u>Operation of teaching at pre-active phase</u>

Selecting Instructional Methodology

- The teacher has to select appropriate instructional strategies and tactics of teaching, keeping in view, of the content and objectives of teaching.

Phases of Teaching

The Pre-Active Phase of Teaching

Operation of teaching at pre-active phase

Development of teaching strategies

- The teacher should decide beforehand about strategies and techniques, which he has to use during the course of his classroom teaching.
- He should decide on the following:
    1. When and what device of teaching should be used.
    2. When the teaching aids will be used.
    3. When recapitulation or evaluation will be done.

Phases of Teaching

The Pre-Active Phase of Teaching

<u>Operation of teaching at pre-active phase</u>

Deciding the duration, place, and management of classroom teaching.

Phases of Teaching

The Pre-Active Phase of Teaching

Operation of teaching at pre-active phase

A decision about evaluation tools and techniques.

- So, this stage is about working out the details of the teaching or activities a teacher want to perform in the class. Here, the teacher hypothesizes about the possible outcome of his action.

Phases of Teaching

Interactive Phase of Teaching

- This phase refers to the execution of the plan made during the pre-active phase.
- It is actual classroom teaching.
- The teacher gives students the learning experiences through some suitable modes.
- Teachers give learners a pre-determined environment.
- The teacher interacts with students so that desired changes can be brought in the learner.

Phases of Teaching

Interactive Phase of Teaching

- Learning is directed in predetermined directions to achieve pre-determined goals.
- The teacher provides learners with verbal stimulation such as
    1. Asking questions
    2. Listening to student's response
    3. Providing guidance
    4. Making explanations.

Phases of Teaching

Interactive Phase of Teaching

Operation of teaching at interactive phase

- This phase of teaching includes all those activities which a teacher uses after entering the classroom.
- It includes the actual teaching done in the classroom.
- In this face to face encounter with learners, the teacher uses some of the techniques, aids, and material planned in the first phase.
- This helps the teacher in achieving the relevant objectives that were already set.

Phases of Teaching

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