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LEVELV

MODULE: THEORIES AND PRACTICE OF TEACHING (20cr)

COMPONENT: GENERAL TEACHING METHODOLOGY (5cr)

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CONTENT

CHAP I. TEACHING METHODS

I.0: Introduction

In this part, you will get to know about teaching methods. Methods are ways of doing things. In any human endeavour where results are expected, there must be ways of attaining the goals.
The various educational goals (or curriculum objectives) have resulted in the adoption of various methods in dissemination of knowledge in class settings. For effective teaching-learning of any subject, a variety of methods need to be brought to play.

I.1Typology of teaching methods

I.1.1Traditional teaching method (teacher centered method)

Main characteristics

Traditional teaching is concerned with the teacher being the controller of the learning environment. Power and responsibility are held by the teacher and he plays the role of instructor and decision maker. He regards students as having "knowledge holes" (lack of knowledge) that need to be filled with information. In other words, the traditional teacher views that it is the teacher that causes learning to occur.

By this method, knowledge is imposed to the learner without considering his/her psychological level, especially the interests and tendencies. The lecturing teaching method constitutes the educational pillar of this school. Brief, the **traditional school is the school where the teacher talks and the students listen passively**. The traditional school is being accused as follow

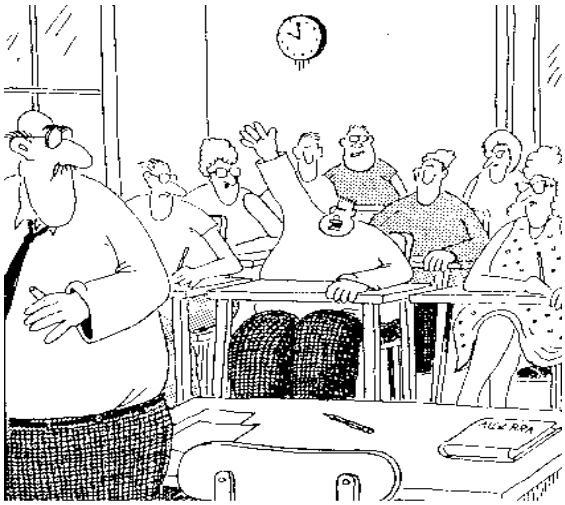
- The teacher talks too much and neglects the learner
- The learner is passive and does not participate actively in the teaching/learning process.

Forms of teacher centered teaching

1) It is a transmissive method (learning by listening)

Lecturing is certainly the most familiar method. This is what we usually mean when we talk about the “traditional method”. Typically, the teacher stands in front of the class, he/she speaks and the students take notes; the lecture can be interrupted by questions.

The teacher controls everything during his/her lecture which takes the aspect of a conference. It becomes more important as the size of the group increases. In fact, the lecture becomes more authoritative, the students listen passively and they are not fully involved in the learning process. The figures below illustrate the traditional method



"Mr. Osborne, may I be excused? My brain is full."

In a small group, the learner feels free to ask questions or to make comments during the lecture: it is therefore an informal lecture.

In a big group, the learners are often more reluctant, they hesitate to interrupt the teacher's lecture by asking questions or giving comments.

The use of visual aids to supplement the lecture is a factor which enriches the lecture. Knowing the fact that we remember only 20% of what we hear and 50% of what we see and hear, the teacher should resort to these means, making use of visual aids in addition to what the learners hear. Therefore, the percentage of information that the learner loses will decrease considerably. Referring to the text above, we can give some advantages and disadvantages of lecture method

Lecture presents the following advantages:

- It is appropriate to teach large groups (hundreds of students)
- It facilitates communication in a short period of time
- Both the teacher and learners feel more secure: the teacher has full control over the content he teaches and the way of presenting it. As for the learner, he trusts the content taught by the teacher.

Here are the limits (disadvantages) of a lecture:

- Lecture presentation does not allow learners to share their knowledge and experience
- If lecture is given too much importance or if it is too long, it can be boring
- During the lecture, it is not easy to evaluate the content which the learners have understood and others which require more details.
- Lecture relies more on teachers and learners' competence and skills: only some teachers are able to communicate orally while keeping the attention of their audience; all the learners are not able to focus their attention on topics which are taught orally
- Lecture does not easily allow to achieve major psychomotor or cognitive objectives
- Lecture can develop a feeling of isolation among learners and between teacher and learner.

- In lecture, learners do not take full responsibility for their learning. They develop a negative attitude of listening passively, they do not develop critical thinking and they do not develop any spirit of initiative.

2) It is an inciting teaching method (questions-answers method)

This method is commonly known as the questioning or question and answer method. They aim to transmit information while taking into account the way the learners receive the information.

The questions asked by the teacher check or assess whether the learners have understood or facilitate understanding/learning.

We know that the fact of asking questions is one of the oldest and commonest practices. Moreover, the results of several studies have shown that the learners ask very few questions compared to the great number of questions the teachers of the primary and secondary education ask to their learners.

Some studies have established that:

- In one-hour class, the teacher has asked about 84 questions while learners have asked 2 questions only.
- A learner asks one question per month throughout the whole school year.

I.1.2. Active methods (Students centered method)

Since the end of the 19th, century, the traditional method faced an opposition of every strong international trend of the New School. Then, the 1st half of the 20th century was dominated by the confrontation and opposition of the defenders. Despite some differences among their ideas, M. MONTESSORI, J.DEWEY, O. DECROLY, E. CLAPAREDE, R. COUSINET and all their disciple accuse the traditional school of abusively being coercive and ignoring the psychology of the child.

Today, “active methods” are the methods that really involve the learner; his/her effort to develop knowledge from the case study, games, the contexts suggested by the learner or the teacher whereby the learner’s role is particularly significant.

According to modern pedagogy,

- The child has gifts, needs, intellectual curiosities, creative energy and assimilation which must occur from the inside to outside.
- Education must comply the spontaneity of the child;
- Education must be done in an atmosphere of joy;
- Education must always take as its starting point the natural and social environment of the child.

Representatives of the new school condemn a teaching process which originates from the objectives arbitrary defined by the adults. They commonly recommend the respect of the student’s interests as they are felt relatively to his/her nature; they thus advise to organize the school according to the needs of the child, rather than impose what he/she must learn. This is the sense of “the active teaching methods”.

By opposition to the previous case, the teacher’s role in a student-centered learning environment is to facilitate and to guide. The students are in control of their own learning and the power and responsibility are the students concern. Learning may be independent, collaborative, cooperative and competitive. The utilization and processing of information is more important than the basic content. Learning takes place in relative contexts and students are engaged in constructing their own knowledge.

For this method, the teacher’s involvement would include questioning, disciplining, guiding, validating, monitoring, motivating, encouraging, suggesting, modeling and clarifying.

Birth of new teaching methods

The new teaching methods appeared at the contemporary era. Since ROUSSEAU, everybody repeats the principle of adapting the school to the child, plus the fact that the child is gifted with a real activity without which the education process cannot succeed. Providing a positive interpretation of the mental development and the psychological activity, this was the role assigned to the psychology of this century and the pedagogy which emanated from it.

Insisting first of all on the functions of receptivity, the psychology of the 19th century tried to explain the whole life of spirit by the elements essentially static whereas the psychology of the 20th century, with analyzing the activity of the child, affirms the idea that the life of spirit is a dynamic reality, an intelligence of the real and constructive activity. This is the point of view of DEWEY in USA, CLAPAREDE in Suisse and too many others.

The new teaching methods were thus constituted at the same time with the psychology of the child and in close solidarity with his/her own progresses. For instance:

In USA, DEWEY created an experimental school where the work of the students was centered on the interests characterizing each age.

At the same time, MONTESSORI, who was in charge of the education of retarded children in Italy, was devoted to the analysis of these abnormal cases. After having discovered that their case was more psychological than medical, she was found at the same time in presence of the most central questions of the intellectual development and the pedagogy of very young people. Generalizing with a usual mastery, MONTESSORI immediately applied what she was taught through experience by the retarded children: during the first stages, the child learns more by action than thought; a convenient teaching aid, helping to inform the action, leads more quickly to the knowledge than the best textbooks and the language itself.

Yet, another Doctor DECROLY studied at the same time in Brussels the retarded children and also came up with his idea of pedagogy. Effectively DECROLY deducted from the psychological analysis of retarded children his famous global method for learning reading, calculating and his general doctrine of "interest centers" and active work. We cannot conclude without reminding the contribution of A. BINET to the pedagogy. His practical realization of tests led to multiple researchers on the measurement of the mental development and individual aptitudes; his theory of intelligence and his book "Modern ideas on children" have rendered several services to education.

General principles of active methods

1) Principle of activity

Activity means that a person learns better if he/she is completely involved in an action. In active methods, the teacher creates a learning environment where the learners take part and communicate among themselves in the group. The teacher avoids speeches. In active methods, the learners learn how to live together, how to behave, they take part and work together to achieve a common goal, the know-how is also acquired in active methods.

The learner's activity is a central concept in most of the explanatory theories of development and learning. The purpose of active methods is to give to the learner more autonomy, more initiative, and more personal motivation and to develop his/her creativity.

At the beginning, active methods were used by the "pioneers' of the New School of thoughts or Active School: Bovet, Claparède, Cousinet, Dewey, Ferrière, Freinet, Montessori…who wanted to break away from traditional teaching and the constraints relationship which characterizes traditional teaching. They based their pedagogy on the activity of the child, his/her functional specificity, and their interest.

Therefore, they thought of education systems in their everyday life, their basic needs, their natural and spontaneous motivations such as games, songs, drawings, and curiosity, etc; these educationalists tried develop children's autonomy, and their capacity "to learn how to learn". They tried to develop self-correcting files, individualized teaching, projects, etc.

2) Principle of motivation

Education must meet the specific needs of the leaner, it is necessary that the learner is motivated and not forced to learn.

Motivated learners develop behavior which pleases the teacher:

- Learners are interested in what has been taught
- They are constantly attentive
- They put more personal efforts
- They do not get tired and they never get discouraged
- They are interested in their progress and achievements
- They learn more quickly than other learners and understand better.

On the other hand, a leaner who is negatively motivated will always seek and find excuses to avoid or neglect his/her studies, with the same courage and the same zeal as the motivated student, but in the opposite direction.

The uncaring learner is physically present and mentally absent. She/he is not motivated even if she/he has the goodwill because he is not interested.

3) Principle of progression

Generally, what seems obvious for an adult or an expert could be mystery for children or beginners. That is why it is necessary to distinguish between mathematical and psychological progression.

Mathematical progression is purely logical and mechanical. Mathematical progression is for an adult who designs programmes or drafts textbooks.

Psychological progression takes into account child psychology and his/her level of mental development. It also takes into account problems and psychological difficulties encountered by a young learner. It is therefore advisable to take into account mathematical and psychological progression, not to follow mechanically the programmes established by adults (Curriculum development centers).

It is advisable to check if the content of the programme is adapted to the level of the learners. If this is not adapted, then find other ways of presenting the contents and provide enough time so that learners can assimilate them. The teaching must take place gradually, the teacher must be ready to make readjustments, revisions, summaries, receptions. For instance, the teacher will have to avoid mechanical application of the procedures or rules while dealing with mental calculation. Mental calculation is truly assimilated by the learners only when the learners have already mastered the procedures.

The teacher must help the learners to list effectively the data of the problem. These data must be selected by taking into account everyday life experience. The language and the vocabulary used in the statement of the problem must be adapted to the level of the learner.

Some forms of actives methods

a) Based on the **size** of learners involved in the learning process, we may distinguish independent learning, individual learning and group work.

1)Associative teaching methods

Associative methods refer to what is commonly called group or teamwork: 3 to 8 learners work together to carry out a practice task, at a given time.

We may not always appreciate the relevance of group work even if the learner discovers many qualities in his/her peers who constitute useful resources to use for learning purposes.

It is important to distinguish group work from peer tutoring. Peer tutoring refers to the process whereby learners help each other and in turn learn by teaching. On the other hand, with group work, there is no tutorship; each team member has the same status and the same role: to get involved in the completion of the task.

Group work requires that the teacher explains to the learners the task to be carried out and gives them the clues or guidelines to carry out the task (allocated time, constraints…). The teacher supervises the activity, he/she moves from one group to another to clarify few things or to encourage individual participation.

You can ask all the groups to carry out the same task, each group can work on its own; this is a **parallel work**. In this case, the outcome of the work carried out by each group is a combination of the individual efforts depending on the number of groups.

Another way of organizing group work consists of sharing a portion of the task to be carried out to each group; this is **complementary work**. The contribution of each group is necessary for the completion of a common task to the group.

Moreover, the tasks can be linked sequentially in such a way that the work of a group can start only when that of another one is finished (the output of group A is an input for group B, the output of group B is an input for group C, etc.); this is an assembly-line work. This type of work organization requires a serious planning.

Some advantages of group work:

- The learner is in direct contact with his/her peers, group work encourages sharing of information and experience
- It encourages the timid learner to get more involved in activities more than larger groups
- It creates strong links which have a positive impact on the classroom environment
- Learners become more responsible, group work encourages learners to undertake new tasks on their own, they become more autonomous as they work
- It promotes a sound emulation among the teams
- Group work offers excellent opportunities to organize formative (continuous) assessment; the teacher can adjust the comments and constructive criticisms to particular needs emerging from each group
- It allows the teacher to develop a more personal relationship with the members of each group.

Some disadvantages of group work:

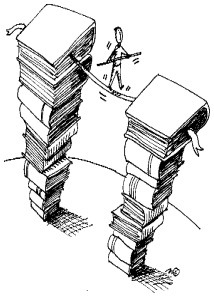
- It can be inefficient for the learners who cannot work without the continuous guidance of the teacher
- Some learners can be frustrated when the groups are being formed
- It does not allow objective assessment of each learner
- It can disturb the teacher who finds it difficult to act as a counselor
- Problems such as finding out a suitable place can occur when trying to organize group work

- Problems such as the use of resources can occur (costs, replacing and bringing new equipment…)
- It is not convenient for all the learners; some do not want to get involved in the task, others are not ready to welcome new ideas from their peers.

Role of the teacher in the group

A teacher should supervise learners in their activities. To do this effectively, the teacher need to develop a genuine interest and concern for the learners. She or he is expected to be on the alert for children who are underachieving and take necessary action to assist such learners.

2) Independent or individual learning



This type of learning exists when the learning or achievement of one student is independent and separate from the achievements of the other students in the class. Students work alone and are not expected to be interrupted by other students. In this regard, students may be seated as far from each other as space permits. Learning resources and materials need to be organized so that each student has immediate access to the appropriate materials. This type of learning aims to be individually beneficial and assessment is commonly judged against a set criteria.

3) Competitive learning

Competitive learning exists when one student goal is achieved; all other students fail to reach that goal (Johnson & Johnson,1991). Competitive learning can be interpersonal (between individuals), where rows are most important or intergroup (between groups), where a group setting is appropriate.

There have been many criticisms of this type of learning:

- Because there is only one winner, all other students must fail
- This type may be linked to high anxiety levels, self-doubt, selfishness and aggression
- It may promote cheating

In light of these criticisms teachers must identify what kinds of competitive activities would have destructive or constructive outcomes.

b) Based on the strategy adopted by the teacher to involve learners in learning process, we distinguish the following methods:

1)Discussion method

What is a classroom discussion?

Discussion is an orderly process of face-to-face interaction in which people exchange ideas about an issue for the purpose of solving a problem, answering a question, enhancing their learning, or making a decision. Bridges (in Killen 1998) suggests that in order for an exchange of ideas to be called a discussion, it should meet five conditions:

- People must talk to one another

- People must listen to one another
- People must respond to one another
- They must be putting forward more than one point of view
- They must have the intention of developing their knowledge, understanding or judgement of the issue under discussion

Discussion can be considered as cooperative thinking aloud. Because students are expected to share their thoughts as they discuss academic issues, discussion is both active and student centered learning. Discussion can be used in many different ways, either as part of a lesson, as a whole lesson, or integrated with one or more other teaching strategies.

When might you use discussion as a teaching strategy?

A discussion can either focus on solving a problem or focus on exploring an open-ended issue. Some of the most appropriate times for whole class discussions may be:

- When you want students to develop a sense of ownership over their new knowledge and responsibility for their own learning
- When you want students to think critically about the subject and develop their skills of analysis, synthesis and evaluation, rather than just memorize facts
- When you want students to develop their understanding by drawing on their prior knowledge and experience
- When your aim is to develop students' communication skills such as stating their ideas clearly, listening to others, or responding appropriately to others.
- When there is a need to develop a sense of group identity so that the students can support each other in their learning.

Advantages of the Discussion Method

- Students maintain a high degree of mental alertness to develop clear thinking.
- Interest is maintained and a feeling of confidence as students learn to express themselves freely.
- Students learn through discussion method owing to active participation and involvement in the lesson.

- Discussion method provides good practice for problem-solving.
- It provides the teacher with information about the students which can aid in a better understanding of the students.
- Teaching by discussion leads to positive attitudinal change because a student may find his or her own values and beliefs challenged by the views of fellow students.

Disadvantages of the Discussion Method

- A lot of time would be wasted before the students arrive at satisfactory answers.
- Discussion method cannot be used so often as it does not allow for easy coverage of the syllabus.
- In most cases, most students do not participate in the lesson because they do not know or know little about the topic of the lesson. They may even be shy or fearful.
- Students who have no background of the topic being discussed may become bored or disinterested in the lesson.
- Since the attention span of the students (young ones) is very short, they cannot maintain high level of attention.

2) Demonstration Method

In demonstration method, you the teacher will do a display or exhibition while the students watch. It typically involves showing students the correct use of science apparatus, illustrating a technique (for example, using chloroform to anaesthetize toads or guinea pigs) performing an "experiment" which is either dangerous, risky, difficult or expensive for individual students use. Demonstration method can be used in the drilling of shorthand outlines, manipulation of various office equipment could be demonstrated by the teacher during office practice lesson. Sometimes demonstrations can be performed by students either individually or in groups. Also in trades like sewing, weaving, barbing, pot making and the like demonstration method is best adopted using the teaching learning processes.

Advantages of the Demonstration Method

- It is an inexpensive method since only the demonstrator needs materials.
- It shows how something is accomplished properly or expertly, since the teacher is supposedly more competent than most students.

- Demonstration method is especially beneficial in the areas of skills and attitudes.
- The proficiency displayed reduces the length of trial and error time.
- It can reduce hazards e.g. breakage and accidents before students embark on individual or group work with materials involved.
- A good demonstration method holds the learners attention thus facilitating learning by giving students the opportunity to see and hear what is actually happening.

Disadvantages of the Demonstration Method

- The assumption made that all the students see and hear equally well does not necessarily follow. Visibility of details of what is being demonstrated is not assured in large classrooms or in circumstances where extremely small objects are used.
- Where the demonstration is restricted to the teacher alone, students will be denied the opportunity to acquire manipulative skills in handling of the materials and apparatus

3) Discovery Method or Research method

Discovery method is a teaching strategy which enables students to find the answers themselves. It is a learner centered approach hence it is called a heuristic method. It is of two types, notably, the guided discovery and the unguided discovery. In the guided discovery, the teacher (you) guides the students to discover for themselves solutions to given problems by providing them with general principles, but not the solution to the scientific problem. The unguided discovery type involves the students discovering for themselves both the general principles and solution to a scientific problem. It is sometimes called the pure discovery.

Advantages of the Discovery Method

- Discovery method, whether it is the directed type or undirected, makes the student an active participant rather than a mere passive recipient.

- Since the method poses a challenge for the student to discover the information or knowledge for himself, retention of any information or knowledge so discovered will be increased.

- The training acquired in finding out things for oneself independently can be applied to new learning and problem solving.

- The joy in discovering something provides the students with intrinsic motivation.

Disadvantages of the Discovery Method

- Discovery method is time consuming and progress is comparatively slow. Apparatus have to be set up and result(s) of the investigation awaited.

- The method leaves open the possibility of not discovering anything. Students may end up discovering things other than what was intended to be discovered. This could be highly demoralizing to them particularly if great effort has been expended.

- The method is expensive considering the equipment and materials needed.

- Discovery method is only good for a small class where effective teacher supervision is possible.

4) Project-Based and Problem-Based Learning

Project-based learning and problem-based learning **(PBL)** are often seen as two teaching methods but overlap in principle; thus, they can be looked at simultaneously. The essential element of PBL is its use of real-world situations for which students must solve a problem by using observational and critical-thinking skills. This method, although seemingly new to modern educators, has its roots with John Dewey's experiential learning model (Aspy, Aspy, & Quimby, 1993). What makes this model of teaching so appealing is the high level of student interest in dealing with the real world.

Some features (characteristics) of PBL are the following:

- Students are given a problem to solve requiring them to gather information, often in teams

- PBL is somewhat unstructured because the parameters for the students are expanded, which enables them to construct their own meaning of what they find when they are solving the problem.

Advantages

- It provides the active participation of the students in teaching-learning activity.
- It habituates student to be orgamized and study regularly.
- It provides students to gain scientific view and thinking.
- It makes students to be interested in learning.
- It helps to improve the sense of responsibility of students.
- It helps students to adopt the view of benefit from others ideas and to help each other.
- It helps students to adopt the idea of not to be hurry to make a decision.

Dısadvantages of problem solvıng method

- It takes too much time.
- It is not possible to apply this method to all disciplines.
- It can load some worldly burdensomes to students.
- It can be difficult for students to provide the materials and sources which is required for solving the problem.
- Evaluating the learning can *be difficult.*

5)Brainstorming Method

Brainstorming is a method used with a group to generate a large number of ideas quickly. It actively engages students in the learning process and encourages full participation as one persons ideas spark off ideas for another. Brainstorming is a valuable activity because it is unlikely that if students worked alone that they would come up with the same volume of ideas. The teacher needs to preselect the topic or issue and facilitate the session, limiting it in time to between 5-10 minutes. Brainstorming has many uses e.g. it can be used to revise a topic, introduce a new topic or solve a problem.

The ground rules are:

- All ideas are to be equally valued
- No criticism of contributions allowed
- No interruptions while contributions are being made
- No evaluation of contributions

Steps involved:

Method 1 – One topic or question posed to the whole group

1. The teacher initiates the process by asking all students in the class to tell him/her everything they know about a specific topic
2. All ideas are allowed. The object is to keep the ideas flowing.
3. Nobody should comment on, criticise or evaluate anyone else's ideas.
4. Points are recorded by the teacher on a flip chart, blackboard or overhead projector.
5. When the brainstorm is completed ideas generated can be organized into groups or categories.

Method 2 – Different topics or questions with a common theme are posed to sub groups within a larger group.

1. The teacher prepares a set of questions around a common theme e.g. 4-6 questions.
2. The larger group is divided into smaller groups and each group is given one of the questions to brainstorm.
3. Each group appoints one person to record their brainstorm and report back to the larger group at the end.

6) The Field Trip Method

This method involves taking learners on an excursion outside the classroom for the purpose of making relevant observation for the purpose of obtaining Technological and Vocational Information. Field trip as a method can be used in teaching Business Studies, Sciences and some art subjects, History, etc.

The Advantages of the Field Trip

- It allows the students to engage fully in the activities of the study.
- It sharpens the students observational abilities.
- It helps to add reality to and verify how the area of coverage operates in practice.
- Field trip is useful in developing all senses of the students.
- It provides opportunity for students to identify ways of spending leisure time profitably.
- Things that cannot be brought to the classroom can be observed and studied e. g. ecological succession, oceans, etc.
- Through direct contact with different occupations provided by field trips students learn and develop an appreciation of the "world" of work outside of the school in relation to school work.
- Experience gained during a field trip can motivate students to read about what they have observed, so as to harmonize actual field experiences with information gathered from textbooks.

Disadvantages of the Field Trip

- Arranging a good field trip necessitates careful planning. Not only does it consume a considerable amount of time, but transportation arrangements are often difficult and may be expensive.
- Class supervision may prove difficult since students tend to move round.

- If not properly planned and organized, the field trip becomes a waste of time and resources and takes away from valuable learning activities.

Even after the most thoughtful preparation and planning, accidents can and do occur in field trips.

7)The Individualized Instructional Method

This method is a programmed instruction in which the learning programmes are presented in carefully structured steps and the steps depend on the individual student and the nature of materials to be learned. For example the pace of learning depends on individual students.

Advantages of the Individualized Instructional Method

- It allows the student to go at his own pace.
- It makes the student to participate.
- It gives the teacher quick knowledge of individual student i.e. whether the lesson is understood or not, since test is usually given at the end of every lesson.
- It can be used effectively to make up for lack of background by particular member of the class.
- It reduces a student's anxiety as he depends on himself.

Disadvantages of the Individualized Instructional Method

- It is time consuming.
- It is highly demanding of equipments and materials.
- It requires very little or no interaction among the students.

8) The Laboratory Method

This is an activity method designed to be carried out by an individual student or a group of students for the purpose of making personal observations from experiments in which students can get conclusions by themselves.

Advantages of the Laboratory Method

- Learning through this method extends and reinforces theoretical learning through reality.
- Laboratory method offers students the opportunity to develop scientific attitudes such as objectivity, critical thinking, carefulness, open mindedness etc.
- Because the method implies learning by doing students tend to be more interested because of active involvement.

- Students become familiar with how scientific knowledge is acquired by performing experiments, recording observations and results, summarizing data and drawing conclusions.
- Through laboratory method, the student learns how to handle apparatus and other instruments, thereby developing manipulative skills.

- Laboratory method promotes problem solving and self reliance.
- Getting involved in laboratory activities can also enable students to learn much about the inter-relationship between science and technology.

Disadvantages of the Laboratory method

- It can be expensive if separate equipment and materials have to be provided.
- It is time-consuming because of the careful planning and preparation required.
- Acquisition of skills which results from exposure to the laboratory method, is of questionable value as objectives for some of the students who will have little use of them later.
- It is an inefficient practice of teaching where ordinary telling method or simple demonstration is perfectly adequate.

9) Inductive and the Deductive Methods

9.1 The Inductive Method

The inductive method of teaching begins with particular examples and from the examination of the examples, definition are established. The teacher tries to draw out from the student the already acquired knowledge. This is done through questioning. Also the teacher tries to relate the knowledge gained is one subject area to another through description of similarities.

Characteristics of the Inductive Method

- It proceeds from the known to the unknown.

- It proceeds from the particular to the general.
- It proceeds from the concrete to the abstract.

- It is an analytic method or process.
- It is a method of discovery.

The Deductive Method

In deductive method a statement or a rule or formula is given. From this rule or formula, the teacher begins to work back to a particular case. For example a formula in mathematics. That is the whole is given and the students are made to see the parts that build it up.

Characteristics of the Deductive Method

It starts from the general rule and proceeds to the particular.

- It is a dogmatic assertion like Christian creed.
- It is a method of instruction whereby the general rule is at first vague to the pupils, but it becomes clearer after the teacher has skillfully and fully expressed it.
- It proceeds from indefinite to definite.

I.2. Criteria for choosing suitable teaching methods

Here are 4 factors which determine the choice of teaching-learning methods:

- Knowing who the learners are
- The teacher's personality
- The learning objectives
- The subjective contents
- The environmental constraints

I.2.1.Knowing who the learners are

No doubt the learner ought to be the main focus of the teacher when deciding the best teaching method to use. If teaching means to facilitate learning, then it is necessary to keep in mind the learner's needs, area of interest, age, aptitudes, preferred style of learning and study timetable.

Types of Learners

Since students are centers of teaching/learning processes, teachers must be able to identify the different types of learners in order to be able to help them. According to Rasaq A. O. (2003), understanding the different types of learners will be of immense value in assisting the teachers in preparing suitable materials to cater for the varying learning needs. There are mainly three

categories of learners and they are: Slow Learners (Backward Learners); Gifted and Talented Learners (Fast Learners); Normal Learners (Average Learners)

The slow learners and the gifted learners are highly problematic whereas the normal learners need to be stimulated and encouraged to make maximum use of their potential and to develop their individual talents.

The fourth group of learners are those that are physically disabled. These disabilities have nothing to do with their intellectual capacity to learn. They are characterized by different types of physical deformities like deafness, blindness and lameness.

Slow Learners

Slow learners are the category of students who lag behind in virtually all that they do, and especially in their school work. They exhibit numerous learning difficulties that seem to defy all learning methodologies and procedures. This category of learners is made up of mentally retarded and the learning disabled

The Characteristics of Slow Learners

- The slow learners have a short attention span, that is, they cannot concentrate for long.
- They have short memory and they don't remember easily what they have been taught.
- The slow learners are always bored and generally have no interest in learning.
- They have poor communication skills. They are poor in both oral and written languages.
- They have poor eye-hand coordination. They cannot see properly nor even copy correctly.
- Their numeric ability is very low and they are very poor in calculation.
- They have poor social interaction and cannot get along with others easily. In fact they exhibit aggressive behaviour most of the time.
- They score low in all types of tests and assessment.

Gifted and Talented Learners

The gifted and talented learners are those whose intellectual abilities are exceptionally and constantly outstanding.

The Characteristics of Gifted and Talented Learners

- They rank high in academic achievement and cover a wide ground within a limited period of time.
- They are fast thinking, highly creative and imaginative with very high constructive abilities.
- They have very good cordial relationships. They make friends easily.
- They have outstanding leadership qualities and can work well under pressure.

Normal Learners

Majority of learners can be classified as normal learners. That is to say that majority of learners are of average abilities.

Characteristics of Normal Learners

- They manifest average ability
- They have their own learning problems like lateness to school, truancy, wrong peer group etc
- They manifest giftedness when faced with challenges.
- They are mostly invariably good in all subjects i.e. science, languages, arts and even sporting activities.

Learners have several needs such as socialization, self-esteem, etc. They also have their areas of interest. Learners can be more motivated in some contexts than in others. They may prefer to express themselves orally or in writing, they may prefer lectures to question and answer method or group work, etc. Bright students for instance, prefer well-structured presentations while dull students prefer socratic questioning. In the same way, some methods are good for upper secondary schools and university students.

The teacher must also consider the stage where the learner is: introduction, acquisition, improvement, demonstration, new learning.

The number of learners is also a significant factor. The psychology of a large group differs from that of a smaller group. The same learners can adopt different behaviors according to whether they ate in large group or small group. For example, the one who expresses himself/herself readily in front of 8 classmates may hesitate to do it in front of about 30. The size of the group is undoubtedly one of the factors mostly called upon to justify the unused of certain didactic methods.

I.2.2.The teacher's personality

The teacher, like the learner, has his/her own interests which inevitably have an impact on teacher's enthusiasm in teaching. In addition to the teacher's interest, his/her aptitude to use a particular teaching method is another significant element.

Some teachers do not have the skills to use effectively some methods. Although others have the aptitudes to use these methods in an efficient way, they do not find any satisfaction in using them. In either of these cases, the teacher may perform poorly. Finally, if the teacher does not know how to apply the methods this could limit his/her performance.

I.2.3.The learning objectives

Here again, the teacher must know the nature, how to formulate, the importance and the end-results of the learning objectives.

The nature of objectives deals with cognitive, socio-affective or psychomotor domains. The choice of the didactic methods will depend to a great extent on the domain under consideration.

The setting of objectives can focus on knowledge, reproduction of a procedure or a predetermined behavior, developing originally or creativity. If the teacher wants his/her learners to report a historical fact (objective aiming at reproducing facts), he/she will be obliged to use a method which is different from that of essay writing (objective aiming at developing cognitive skills, creativity).

It is necessary to acknowledge that the achievement of some objectives requires more time and energy than others. Finally, an objective can be reached at various levels, from minimum success to perfect mastery.

I.2.4.The subject contents

In theory, all methods are appropriate to teach any discipline. But, the amount of information to be taught in course can be more or less significant. When the subject contents are too big, teachers will try to allocate appropriate time to some parts of the contents. The content to be covered is another element which must lead the teacher to the right choice of the best teaching methods to use.

Preferably, the contents of a more practical nature will be associated with the didactic methods which give priority to application and manipulation; while the contents of a more theoretical nature will be associated with the didactic methods which require understanding.

I.2.5.The environmental constraints

Pedagogical tools also play a major role in the choice of didactic methods. In his efforts to achieve the objectives, the teacher must know how to manage his/her time when he/she uses pedagogic tools.

The budget allocated to a course or a programme can also limit considerably the choice of didactic methods. The teacher may not use useful methods because he lacks financial resources. He/she has to resort to other methods, which require modest budget.

Lack of equipment (audio-visual, data-processing or other material) may prevent teachers from using useful teaching methods. Even when there are facilities and equipment, it is not always easy to benefit from these resources. The planning of schedules, the distribution of resources and

the use of material constitute a significant activity which must be done in collaboration with other education stakeholders.

Finally, the school environment, the choice of a suitable classroom, the dimensions of the classroom, the number of learners, the possibility to modify and arrange furniture, the acoustics, the possibility to black out windows for projection… are some elements to be taken into consideration.

CHAP.II FORMAL PREPARATORY ACTIVITIES OF THE TEACHER

II.1 Lesson planning/Preparation

II.1.1 Definition

A lesson is defined as all resources used by teachers to make his/her students acquire knowledge.

Preparing a lesson is to plan in advance what will be taught, how to teach it, the resources to be used and ways of assessment. It is during the planning that the teacher does research on the topic, he/she compares different documents available in order to master the topic, and chooses the essentials that fall within the level of students.

It is therefore not to scribble on paper references notes that will be dictated to students, but the design of all learning activities. This implies planning in advance student activities (learning activities), activities of the teacher (teaching activities) during the lesson and notes to be given to

II.1.2 Advantages of a well planned lesson:

advantages of a well-planned lesson can be summarized as follows:

-A teacher who has prepared his lesson is comfortable in the classroom, he is confident, he does not hesitate and is not afraid of committing errors because he has checked, planned, and ordered everything.

- He/she has got authority and the discipline is maintained because he/she attracts students' attention and keeps them working all the time, they do not have time to get bored and upset.

- His presentation is clear and orderly, the questions are well arranged, he/she progresses from simple to complex, from easy to difficult.

Some other reasons of preparing a lesson as mentioned by Afolabi and Adesope (2010) include:

- To avoid omissions and to prevent repetitions
- It assists in choice of teaching methods as well as choice of instructional materials.
- It instills confidence, security and removes nervousness from teachers.
- It helps the teachers to think out new ways and to discover when to act in a particular way.
- It assists the teacher to prepare for individual differences.
- Other teachers can stand in proxy when unavoidably absent. It enhances economy of time and resources.
- It gives direction to the lesson

II.1. 3 Disadvantages of an ill-prepared lesson:

An ill-prepared lesson is associated with a number of drawbacks:

- The teacher is anxious; he/she hesitates at each stage, which leads him/her flipping through the books all the time, resulting in a great waste of time.
- The lesson is not orderly, there is no logical progression, the learner fails to grasp the essential, he/she gets confused, and then drops out completely.
- If there is no activity, the students are not participating, and there is therefore no performance.

However, the teacher should not be a slave of his/her lesson plan; he/she can go beyond it without losing the thread of the essentials. This is an example of teachers who do not want to answer questions raised by their students under the pretext that they (questions) are not part of what has been prepared on the one hand, and, on the other hand, teachers who are wasting their time moving away from the topic of the day and tackle those topics proposed here and now by the students.

II.1. 4 Steps involved in developing a lesson plan

4.1. Pre-lesson preparation/Indirect/Distant lesson preparation

Preparation of a lesson plan is not an easy task; that is why before taking a paper and start the written lesson preparation, the teacher must collect all necessary and important information

- Consult the current scheme of work for the topic.
- Think out the objectives of the lesson.
- Consult reference books and textbooks.
- Organize and assemble materials needed for the lesson in logical sequence.
- Decide on the teaching aids to use.
- Think of the most suitable methods of teaching to use.
- Think of the subject matter and questions required at each stage of the lesson.
- Ensure accuracy and adequacy of facts.
- Think of provision for individual differences in learning.
- With all the above, the teacher has a very clear mental picture of the lesson plan

The following other information are also important because they direct the teacher in the choice of methods and strategies of teaching

- The size of the class
- Ability of the learners
- Characteristics of the learners
- Topic of the lesson

4.2. Immediate Lesson Preparation

This is the actual lesson preparation conducted with a well determined learning objective(s).

Objectives of the Lesson

- A good lesson plan will have specific aims and objectives to be achieved.
- The objectives must be simple.
- The objectives must be capable of being achieved within the stated period.

Presentation of Lesson

The lesson must be carefully planned in such a way that the presentation of it will allow for good coverage of the topic, teachers' activity, students' activity and good conclusions. Ringing of the bell should not end the lesson abruptly. To allow for good time, the teacher should not prepare too much and the teaching materials should be within reach. One should avoid too much time on trivial issues during the lesson. Teacher's activities during the lesson may take the form of questions or practical demonstration. While student's activity deal with student's involvement i.e. answer to teacher's question exercises to work.

Division of a Lesson

Most lessons are made of four parts : introduction; development; conclusion; summary and evaluation. Time of these parts may vary from lesson to lesson but every part must have its own fair share of time.

Introduction

A good lesson should begin with good introduction, which is interesting and could arouse students' interest and attention. A good lesson should have the following qualities.

- Should present the problem to be answered during the lesson.
- Should be able to tell what the lesson is about.
- Should make use of teaching aids like pictures and diagram.
- Should be able to have questions that can be used to revise the work covered in the previous lesson.
- There are different ways of introducing lesson thus every lesson should not be introduced in the same way.

Development

Development is the main body of the lesson. This is a period of exposition, when the teacher teaches new materials and this could come in different stages or steps.

Evaluation

This is the last stage of the lesson. It deals with finding out the extent to which the teacher has succeeded in imparting the knowledge. This is the stage where the success of the lesson is determined. The teacher will know if the objective of the lesson has been achieved or not. Evaluation involves asking questions from the students based on the topic treated. Students also will know whether they have followed or not. If the students respond to questions very well it means the teacher has succeeded but if otherwise he has failed. A teacher who fails to evaluate his lesson is not a good teacher.

Summary

This is a brief review of the whole lesson where the teacher goes over the lesson again informing the students the ground covered. After all the steps have been properly covered the teacher gives the students assignments on area covered. When an assignment is given, date of submission must be indicated. Areas not clear in the lesson will be made clearer while attempting the assignment. Assignments must be marked, recorded and scripts returned to the students to enable them correct their mistakes.

Conclusion

This is towards the end of the lesson. Conclusion can take the following forms

- Brief revision of what has been covered in the lesson.
- Students reporting on what they have gained.
- Linking the conclusion with the next topic.
- Giving homework, which could serve as a logical outcome of the lesson.

Example of Competence – based Lesson Plan

School Name: …… **Teacher's name**: ……

Term	Date	Subject	Class	Unit Nº	Lesson Nº	Duration	Class size
1	15 /06/ 2015	Physics	s.1	Unit	6 of 8	40	30 (20 boys

				1		minutes	and 10 girls)
Type of Special Educational Needs and number of learners :				1 learner with hearing difficulty and 2 learners with low vision difficulties.			

Topic area:	Mechanics
Sub-topic area:	Introduction to physics
Unit title	Laboratory safety rules and measurement of physical quantities.
Key Unit Competence:	By the end of this unit the learner should be able to explain the importance of physics, measure physical quantities and express findings in appropriate units.
Title of the lesson	Measurement of density of water.
Plan for this Class (location: in / outside)	Laboratory
Learning Objectives(inclusive to reflect needs of whole class)	Using floating bodies in water, the learners will adopt science processes skills and suggest what happens to a body placed in water and distinguish clearly density of water before and after stuffing in more matter.
• **Knowledge &understanding**	Describe how the density of water changes when mixed with other substances.
• **Skills**	Perform an experiment to investigate how a body floats in water based on its density.
• **Attitudes & Values**	Be aware of the changes on density of water when stuffed with other substances.
Learning Materials (for all learners)	60 drinking glasses, 60 eggs, 5 kg of table salt and 30 spoons.
References	–Abbott, A. (1989). Ordinary Level Physics. Chicago: Heinman Educational Publisher.

Timing for each step	**Description of teaching and learning activity** Through performing an experiment of the floating egg, the learners will determine science processes skills and what happens to eggs placed in water and distinguish clearly the density of water before and when more matter are stuffed in.		**Competences and cross cutting issues to be addressed**
	Teacher's activities	**Learner's activities**	

Introduction **4minutes**.	Motivate learners by asking them what they observe in front of them and predict what happens when one of the eggs is mixed with water in a drinking glass? Facilitate the learners to think about the topic of today **Guide the learners and display the objectives of the lesson**	Recall the concepts of mass and volume. They think what happens. Discuss the question and take position In pairs, they present their thoughts. **Predictions:** The egg may: burst, float, sink, fold, increase in size…… Discover the objectives of the lesson	**Knowledge:** Density determination. **Skills:** Observation, analysing, and reasoning. **Attitudes and values** Adopt some of the scientific processes skills used in learning physics. **Skills:** Critical thinking

Development of the lesson 30minutes.	Lead the process of examining learners' predictions. Give the opportunity to the learner to suggest how to verify their predictions Guide the learners in pairs to perform an experiment following given guidelines after having a good discussion on the instructions. Facilitate and moderate the session of presenting the results and identify the concept of foating of an egg.	Learners recognize that they have different views on how a body floats Learners suggest different ways they think can help us to verify theirs predictions Learners start performing the experiment following the guidelines. Present the results and write the feedback on the working sheet. Compare the results with different predictions	**Knowledge:** The density of water changes when mixed with other substances. **Skills:** Observation, communication, manipulation, discover, cooperation, appreciate. **Attitudes and values:** Be aware of the changes on density of water when stuffed with other substances. **Cross cutting issues:** Standardization of culture; Gender Peace and values
Conclusion 6minutes	**Summary** **Possible answers:** An egg sinks in first glass of tap water because the egg has a greater density than the tap water and floats in the second glass of salt water due to a change in density of water and generalize with the real life.	Correct their reports	**Knowledge:** density determination **Skills:** Scientific analysis. **Attitudes and Values:** Adopt science processes skills.
	Assessment Verify the level of attainment of		**Knowledge:** Content recognition

	the learning outcomes using different techniques. Explain what happens and why an egg sinks and floats when placed in : a) drinking glasses filled with tap water b) drinking glasses filled with salt water solution	Apply the new concepts to respond to the problem that arises on tasks related to the density.	**Skills:** analysis **Attitudes and Values:** Being task oriented and time management.
	Returning back the material provided Ask learners to return the material and reorganize them/ Reset the initial sitting of the class	Clean/rearrange/submit all the material used and reset the initial sitting in a very responsible way	**Knowledge:** Content recognition **Skills:** Management and maintenance skills, **Attitudes and Values:** accountability, responsibility,
	Next lesson Ask learners to suggest next lesson by referring to the current lesson	Imagine in connection with the current lesson what they think should follow as a next lesson	Critical thinking, analysis
Teacher self-evaluation			

II.2 The Scheme of Work

The scheme of work is the breaking down of topics in the syllabus into series of lessons. Scheme of work in any subject is a clear and orderly statement of the work the teacher proposes to do in a given period. The work is for a year and it is divided into weeks and/or terms. Weekly scheme serves as a good guide to the teacher

2.1 Scheme of work should contain the following:

- Term and Week

- Topic of Study
- Learning objectives
- Teaching Aids
- References
- Evaluation
- Observation

2.2 Importance of scheme of work

The scheme of work is usually an interpretation of a specification or syllabus and can be used as a guide throughout the course to monitor progress against the original plan. Schemes of work can be shared with students so that they have an overview of their course.

2.3 Advantages of using a scheme of work

- A scheme of work makes a careful and logical arrangement of work to be done.
- It encourages course work to be covered within a stipulated period of time.
- In case of emergency, it allows for a substitute teacher to stand in for the regular/ substitute teachers to stand in the regular/substantive teacher without much problem.
- It is a good instrument to evaluate the coverage of the syllabus

Sample of scheme of work

Date	Unit title	Lesson tittle	Learning objectives	Teaching methods and techniques	Resources and references	Observation
23/1-27/1/2017	Unit 1. Indices and suids	Indices/power	Recognise law of indices perfoms on indices, appreciate the importances of indices and suids in solving mathematical problems	Learner centred methodology	MK secondary for Rwanda students' book one	Done
30/1-3/2-2017	Unit 1. Indices and suids	Applications of indices -Suids	Use of standard form to represent a number	Encouraging the group work to discuss about	Student's book for S2	Done

		- Rationalisation -	recognise the conjugate of suds	their solutions		
6/2-10/2/2017	Unit 1. Indice and suid	Square roots calculation method: Factorisation general method	-	-	Idem	Done
13/2-17/2/2017	Unit 2.: Polynomials	Definition. Polynomials, binomials, monomials and trinomials	Define poormlynomial, recognize operation, properties perform operation of polynomials	Group work	New general mathematic Student's book	Done
20/2-24/2/2017	Unit 2. Polynomials	Operations on polynomial	Expand algebric expansion	Group work	idem	Done
27/2-3/3/2017	Unit 2, polynomials	Algebric identities factorisation of polynomials	Factorise a given algebric expression using appropriate method	Group work of learners	Idem	Done
6/3-10/2017	Unit 2 polynomials	Factorisation of quadratic	Expend algebric identities	Idem	Idem	Done
13/03-17/2017	Unit 2. polynomials	Expression	Appreciate the role of numerical values To develop critical thinking and reasoning	Idem	Idem	Done
20-24/3/2017	Examination					Done

27-31/3/2017						

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