
UNIT 1 COGNITIVE SKILLS

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1.0 INTRODUCTION

In distance education (DE), learners are expected to acquire knowledge through creative methods by working on the activities or exercises given in the self-learning materials. In addition to these they also need to remember some important dates, for example, teleconferencing schedule, virtual class timings, last dates for submitting assignment responses, filling up term end examination forms, etc. The learners require cognitive skills to carry out these responsibilities in accordance with their abilities.

Cognitive skills are those skills which help learners to read effectively, write passages, essays, reports, make numerical calculations, and expedite Information and Communication Technology (ICT) skills. Neisser (1967) said that cognitive skills are the processes by which sensory input is transformed, reduced, encoded, stored, recovered, and used.

The major concern for a distance learner is: In what ways s/he can learn better and effectively? In other words, they desire to know how learners use the learning tools in their learning activities. If we say they need to learn some procedures to do so then that leads to another question: What skills they need to adopt or develop so that they can have command and control on these procedures? Cognitive skills, which comprise of knowledge, skills and actions help learners to accelerate their learning activities in more effective and efficient ways. Thus, it is a prerequisite for knowledge acquisition.

The specific subject matter that is operational for investigative purposes encompasses mental states and processes (Butterfield and Dickerson, 1976). Several processes associated with cognitive behaviour are perception, information, representation in memory, use of knowledge (Norman and Rumelhart, 1975), sensation, imagery retention, recall, problem solving, and thinking (Neisser, 1967). The manner in which a learner employs these various processes in relation to his/her personal cognitive capabilities for the efficient use of information, in activities such as comprehension, listening, and reading, is the major determinant of individual differences in the acquisition of skills (Simon, 1975).

1.1 LEARNING OUTCOMES

This unit will explain the significance and need of cognitive skills in teaching learning domain in global and distance education in particular. It further analyzes and examines how cognitive skills help learners in their learning activities.

After working through this unit, you should be able to:

- Discuss the components of cognitive skills;
- Explain 'cognition' in teaching learning contexts;
- Illustrate types of memory;
- Elucidate the significance of cognitive skills in the open and distance learning;
- Analyze the revised Bloom's taxonomy on cognitive learning; and
- Differentiate Mind Mapping from Concept Mapping.

1.2 WHAT ARE COGNITIVE SKILLS?

Cognitive skills are the basic mental abilities that we use to think, study, and learn. In the context of distance education, they are regarded as any mental skills that are used in the process of acquiring knowledge, covering a wide variety of mental processes such as; ability to identify images, analyze sounds, recapitulate information, search facts in memory, associate and dissociate different pieces of information and use them in appropriate contexts. Cognitive skills accelerate learners' efficiency, strengthen their ability, and capability in learning activities. In a sense, they make learners' learning easy and comfortable. It is stated that cognitive skills are the skills that help learners in the transfer of their skills to the requisite skills to facilitate their study and establish learning as an easy processes. With the help of cognitive skills we can cognize objects, events, concepts, in the appropriate contexts. Thus, the basic question needs to address here is that "What is cognition?". Cognition in teaching learning domain is interchangeably used as 'knowledge'. It is an 'apprehension', or 'consciousness', or 'awareness' of an object. It reveals or manifests all objects just as the light of a lamp reveals all physical objects. The object of apprehension may be a substance, quality, an act, an emotion, the existent and non-existent things of the world. But in all these cases, cognition means there must be something that stands out as the object of knowledge.

Cognition is of two types. These are:

- i) Presentative cognition
- ii) Representative cognition (memory)

In presentative cognition, the objects are directly presented whereas in case of representative cognition (memory) the objects are indirectly recalled. All sorts of cognition may not be valid because to have a valid cognition, there should be the right apprehension of an object. In other words, cognition is valid when knowledge of an object must correspond to the reality. Thus, it states that a valid cognition is the manifestation of an object as it is.

There are some situations where knowledge of an object is presentative in character but not valid, such as; 'doubt', and 'error'. Doubt arises due to the isolation of mind between certain positions. In 'doubt', the cogniser is unable to decide the content of cognition. For example; the snake and a rope are alike. As a result, we are in a position to doubt a rope as a snake. This happens because of the following reasons:

- i) Something is presented before the cogniser
- ii) Cogniser is unable to decide the cognition
- iii) Certain alternatives are equally forcing to recognize the object
- iv) It results in the form of interrogation.

Consider the issue 'error'. It is also representative in nature but not a valid cognition. In 'error', an object is cognized as having certain characteristics and these fall outside of its being. Thus, it is a wrong apprehension in which the object is taken for what it is not. For example, cognizing shell as silver.

Now, what we mean by the terms 'cognition' and cognitive skills should be clear to you.

1.3 COMPONENTS OF COGNITIVE SKILLS

Cognitive skills have some essential components. These are:

- Perception
- Memory
- Logical thinking
- Concentration
- Rational attitude.

Let us discuss these components in the context of distance learning and acknowledge their role in teaching learning activities.

1.3.1 Perception

The term "perception" is understood here as looking things in right perspectives. But it is noticed that different people perceive an issue differently because of various reasons which we are not elucidating here because it is not our present concern. Since they perceive differently they have different opinions, and therefore they treat an issue differently. For example, "She is sharp". This sentence is

understood differently by her teachers, parents, colleagues, and intimate friends though it conveys one and only one meaning, i.e. about her talent. Thus, perception is contextualized, subjective, and depends on many other extraneous surrounding factors. To support this argument Immanuel Kant (1724-1804) says that we see things not as they are but as we are. In the context of DE, It is suggested that learners should perceive things or facts correctly and by doing so they can adapt right perception and hence, it should guide them to achieve their goals. For example; Susama and Mamata have received their assignment responses back with tutor comments and grades. Susama got 'A' whereas Mamata got 'B' grade. In this situation, Mamata claims that Susama wrote assignment responses by getting help from me and scored higher than me. Thus, there may not be proper evaluation happening in the DE setup. Again, the evaluation procedures may not have been followed strictly by the evaluators. Hence, she got demotivated towards her studies. In this case, it is advised that Mamata should perceive the fact correctly why she did not receive 'A' Grade instead of comparing Susama's grade with hers and getting disoriented in her studies.

Check Your Progress 1

- Notes:** a) *Space is given below for your answer.*
b) *Compare your answer with the one given at the end of this unit.*

List the components of Cognitive Skills.

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1.3.2 Memory

Memory as one of the main components of cognitive skills helps learners in remembering, and recapitulating events, or concepts, or particular objects in their actual forms. It is of five kinds. These are:

- i) Short term memory: It lasts from a few seconds to a minute.
- ii) Long term memory: An ability to recapitulate the long past events.
- iii) Receptive memory: Remembering the physical postures of an object of recent past.
- iv) Sequential memory: Remembering things in an order.
- v) Rote memory: It is a habit to learn and remember certain information.

These memories are not only assisting learners to recast their study

content on time but also relate this information to their experiences for better understanding. Long term memories become the library of facts upon which learners build their concepts and accumulate knowledge. Short term memory helps to capture the dynamic data during the learning experience.

Apart from these memories, there are two other important memories also found in teaching-learning activities.

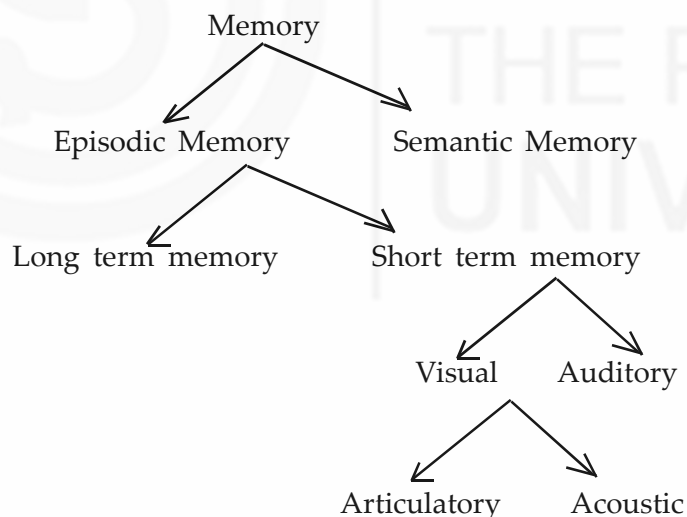
- a) Episodic Memory
- b) Semantic Memory

Episodic and Semantic Memory

Episodic Memory is memory for personal experience; Semantic Memory is for acquiring the knowledge about the world. Knowledge available for an attempted understanding of learning strategies comes mainly from studies of Episodic Memory. But probably most of what goes in a practical learning situation is recognition of Semantic Memory (O'Neil, H.F. Jr and Spielberger, C.D., 1979, P.102).

According to Tulving (1972), "Episodic Memory receives and stores information about temporally dated episodes or events, and temporal-spatial relations among those events. Semantic Memory is the memory necessary for the use of language. It is a mental thesaurus, organized knowledge a person possesses about words and other verbal symbols, their meanings and referents, about relations among them, and about rules, formulas, and algorithms for the manipulation of these symbols, concepts, and relations" pp. 385-386.

A diagram of the memories is placed below for your understanding and reference.



The function of memory is irreplaceable in learning activities. This is so because learning is to understand, conceptualize, analyze, interpret, remember, and recapitulate the issues or events. Hence, memory becomes a vital component of learning. Learning through any means requires memory functions because it is the memory that decides the correct and relevant information to receive and process, from the irrelevant and unnecessary information among other varieties of information. Memory helps us to recall where the particular information is located and how it can be traced out.

1.3.3 Logical Thinking

Thinking logically means thinking step by step or in a chronological order. And to do so learners need the support of mental processes. And these can't be inherited from our ancestors nor would it be considered as a matter of genetic endowment. To think logically on an issue is to acquire a systematic study and understanding. It guides us to apply our reasons constantly and consistently to achieve a particular pre-determined goal and even assists us to get multiple solutions of a problem. It improvises our performance in reading, writing, searching/ browsing, and organizing study materials.

1.3.4 Concentration

Concentration is one of the chief mental functions of human beings. It is an ability that assists learners to remain mentally alert on a particular object, issue, subject content, etc. and observe the same carefully. Without concentration there may be no activity, be it academic or non-academic.

You might have experienced that at times plenty of things stimulate your sensory receptors. But all are not transformed into mental representations. You select one or two objects depending on the priority of your work and time limit, and you ignore the rest. If you can not select and concentrate on a particular object, then your mind may be distracted by a number of uninvited stimuli around you, such as; smell, taste, noise, etc.

To improve your concentration, you should adhere to these guidelines:

- a) Ensure understanding of the subject contents
- b) Retain and maintain interest in the subject matter
- c) Have a purpose while doing any activity
- d) Make sure your attention is focused
- e) Transform good procedures into habits
- f) Reward yourselves once you achieve the pre-set goals

Concentration is of three types; (i) an ability to concentrate on a particular task (ii) an ability to focus on several important tasks at once (iii) an ability to filter irrelevant information and remain focused on a particular task. Concentration is an act of will and doesn't happen automatically. Thus, concentrating on a particular task guides learners to fix their priority and set their attainable goals which help them in achieving success. This practice even assists them in grasping the study contents systematically.

Check Your Progress 2

Notes: a) Space is given below for your answer.

b) Compare your answer with the one given at the end of this unit.

Write the types of concentration.

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1.3.5 Rational Attitude

Rational attitude is interpreted here as positive behaviour towards an issue or an object, or subject of a study. It says not to give up your hope on any issue. If you are determined and committed to do a task, and wish to work on your shortcomings to overcome the avoidable barriers, you can reach your target. This enables them to fix achievable goals on a par with one's abilities and capabilities. It guides learners to move in the right path. It helps them to take correct decisions on an issue. To develop this attitude one needs to be focused on a particular attainable goal. For example; all distance learners want to successfully complete their courses within the stipulated time and achieve success in their studies. To do so one should develop the rational attitude within himself/herself and try to do the regular academic activities on time. Even by doing self assessment questions and exercises they can enhance their learning experiences. Further, rational attitude assists learners to search and process the information by overpowering their laziness. It develops the critical thinking and creative approaches in their studies. Thus, it empowers learners to consider the learning activities as a routine work and easy task.

In these ways, components of cognitive skills immensely assist learners to do their routine activities religiously, regularly, and enable them to comply and complete their study tasks in time.

1.4 COGNITIVE SKILLS AND DISTANCE LEARNING

Cognitive skills are intended to promote inquiry learning which is a part of educational methods. To define inquiry learning, it is interpreted as an educational activity in which learners either individually or collectively investigate a set of phenomena—virtual or real, and draw conclusions on it. According to Dejong and Van Joolingen (1998), learners direct their own investigatory activity but they may be prompted to formulate questions, plan their activities, draw and justify conclusions about what they have learnt. They come to understand that they are able to acquire knowledge that they desire, virtually in any content domains, in a way that they can initiate, manage, and execute on their own, and that such knowledge is empowering (p.496). Since DE inherently accommodates different learning styles, learners prefer to adopt technological instructions in their learning. This is so because the technological environments are multimodal and are supported by audio, video, texts, and provide facilities to individual as well as groups to interact in synchronous and asynchronous formats. Technological platforms support learners to represent linear and nonlinear content, and hence providing a variety of learning tools to cater different learning styles adopted by learners. In this context, Bruner (1961) says that a strategy developed by a learner in accordance with cognitive abilities and situational demands would be most effective in relating new information to previously obtained experiences.

Learning and cognition are highly interdependent with each other because both need a platform called 'understanding'. According to

Novak, meaningful learning involves the assimilation of new concepts and propositions into existing hierarchies (Lanzing, T., 2004). Salomon, Perkins and Globersen (1991) suggest that cognitive tools or mind tools refer to technologies, tangible or intangible, that enhance the cognitive powers of learners during thinking, problem solving, and learning. In Jonassen's (1970) view learners are active constructors of knowledge. He expresses that cognitive tools are developed to function as intellectual patterns to enable and facilitate critical thinking and higher order learning. Cognitive skills empower learners to design their own representation of knowledge and use those to support deep reflective thinking. Thus, cognitive tools enable learners in mindful challenging learning. Dansereau (1978) says that cognitive skills help learners to identify the relevant and pertinent materials for their courses. It also helps them to retrieve information under appropriate situations or contexts.

1.4.1 Technologies as Cognitive Tools

In distance education (DE) settings as such the technological intervention is quite a common phenomenon. Here, technology doesn't stand alone as media, rather it is observed as integrated phenomena. Learners learn in technological environment through multiple media. The use of web-based learning or online learning falls within this category. Learning through technology requires learners' self regulation, motivation, and time management approaches. It helps learners to learn successfully in DE settings. Participation in technological environment becomes crucial for learning to happen and this can facilitate, collaborate, and cooperate lifelong learning. Thus, learning through technology is an inquisitive approach to effective learning.

In the technological platform, nothing stimulates DE except web based learning. The web is now causing educators, instructors, and even learners ranging from pre-school to higher education to identify the very nature of teaching and learning differently. Researches have found that web can facilitate free teaching which may liberate learners from the physical boundaries of classrooms and the time constraint of class schedule. The earlier practice of classroom lectures becomes webcasted through multimedia which inspires learners in their learning experience. Learning through multimedia helps learners to reorganize and reinvent. Thus, it supports learner-centric education rather than teacher centric instructional curriculum.

Learning through technology certainly has potential benefits provided learners show their inclination on technological use and are acquainted with its multiple applications. In this regard, Cuban (1993) pointed out that the following advantages can be derived by using computer in teaching learning domain:

- i) to keep the education system at the forefront of technological development and learners' skills up-to-date with those expected in the workforce;
- ii) to increase efficiency and productivity in teaching and learning; and
- iii) to enable more self-directed learning

Cognitive skills help in improving learners' reading and writing techniques, considered to be essential tools for all learners. Further, communication skills are also guided by the cognitive skills. Here we will discuss how reading and writing techniques and communication skills help distance learners in accomplishing their study tasks.

1.4.2 Reading and Writing Techniques

In the context of DE, reading and writing techniques are the key issues for the learners. It is so because they need to deal with these two activities in a rigorous manner. To enhance reading and writing techniques they require cognitive skills, such as concentration, memory, logical thinking, and communication skills which have been discussed earlier in this unit. These features help a distance learner to carry forward his/her learning tasks in a successful manner.

There are five stages to acquire the reading competency which is supported by cognitive skills, prescribed by Chall (1979). In the first stage, learners learn the basic decoding skills. It means they learn the letters of the alphabet: how to represent the letters phonetically, what the letters are for, and how to distinguish similar looking words (e.g. book vs. ball). In the second stage, learners involve in consolidating what was learnt in the first stage. Extensive practice with reading materials that is already familiar and known permits learners to concentrate on written words and practice their decoding skills. In the third stage, instead of concentrating on learning to read learners begin to use reading to learn, i.e. they use reading to acquire new knowledge about the world. In this stage they learn new facts, concepts, and events of the world besides their concentration lie only to progress in their learning and understanding the issues that they are reading. In the fourth stage, learners read to acquire new points of view and new multifaceted concepts. At the final stage, they learn to use written materials to serve their own specific purpose, i.e. they know which parts of a text to read, which to skim, and which to avoid (Chall, 1979, p.44).

Whenever we discuss study techniques immediately SQ3R techniques (S: Survey, Q: Questioning, R₁: Reading, R₂: Reviewing, R₃: Recalling/recapitulating) appear in our mind though these do not constitute all the activities of study techniques. It suggests some other techniques as well, such as;

- a) Developing time management approach
- b) Familiarizing with the course
- c) Self-motivation
- d) Coping with stress
- e) Setting attainable, achievable, and possible goals
- f) Peer-group interactions
- g) Developing online search skills
- h) Evaluating one's own progress at regular intervals

By practicing these techniques, learners can organize, plan, and execute their study effectively and purposefully, and hence, learning

becomes an easier and lifelong phenomenon for them. Without these skills learning will be difficult or just impossible for them. The key to solving a pertinent learning challenge is to strengthen a learner's basic processing or cognitive skills.

1.4.3 Developing Communication Skills

Communication skills assist learners to communicate their thoughts intentionally and purposefully. It suggests that one can share his/her feelings, emotions and even inner desires to others if he/she uses the correct vocabulary in the sentences before his/her deliverances (either written or utterances). Communication skills help us to construct not only a bond between 'learners and tutors', but also among their peer groups. In addition to these, they assist in accessing subject contents in an easy, comfortable, and progressive ways.

All these components of cognitive skills together suggest that learners can enhance their learning experience by adapting and practicing these skills in their study tasks. Further, these assist learners not only in identifying images, analyzing sounds, recapitulating information, searching facts in memory but also in learning scientifically and arguing logically. By supporting in these ways cognitive skills encourage and inspire learners to do multiple activities in various fields and be creative in their approaches and understanding.

From the above analyses it is asserted that there are two basic elements required for the development of cognitive skills. These are 'language' and 'logic'. The developments in use of language alongside the logical organization of thoughts are basic prerequisites for building cognitive skills and exercising learners' ability to handle study tasks and preserve update information for their learning activities. Both are in a process of continual development and they allow learners to construct and use certain skills which are vital for the acquisition of knowledge and for the further development of human activity, behavior, and movement.

Cognitive skills comprise of information processing tools and all the data which one possesses throughout one's life. Without the development of cognitive skills we will be having great difficulty in handling information, transferring them into knowledge, and being able to use them in actual learning contexts.

A basic question arises on 'learning', i.e. how does a learner improve his/her thinking while learning? Bloom's Taxonomy may help to answer this question in an appropriate manner.

1.5 BLOOM'S TAXONOMY

Bloom attempted to answer this question by developing a method of classification for thinking behaviours that were believed to be important in the processes of learning. Eventually this framework became taxonomy and was found in three domains.

The cognitive – knowledge based domain, consisting of six levels

The affective – attitudinal based domain, consisting of five levels, and

The psychomotor – skill based domain, consisting of six levels.

Here, we will discuss only the cognitive domain because of its relevance in this unit. Bloom has depicted the six cognitive levels of thinking in a stairway. It starts with the lowest level named as 'knowledge' and ends with the highest level termed as 'evaluation'. The sequences from the lowest to highest level are: knowledge, comprehension, application, analysis, synthesis, and evaluation. This taxonomy is presented in a hierarchical form because if a learner is functioning at the 'analysis' level it is assumed that s/he has mastery over the study contents or subjects at the 'comprehension' and 'application' levels.

This hierarchy of 'thinking' and 'learning' in educational paradigm is changed in the later period by Bloom's pupil **Lorin Anderson**. The later version is much appropriate because it is framed keeping in mind the latest curriculum of subject of studies available across the globe, instructional design of materials, technology integration, creative and critical thinking of learners, and the assessment and evaluation patterns used in the academic programmes in the educational domains scattered in all countries of the world. In short, it has been revised by considering the present demand of teaching learning activities. The changes are found in three broad categories: terminology, structure, and emphasis. The major category is prominently marked in the changes as *verb forms instead of nouns*. These changes are also presented in the hierarchy forms. In this case, the lowest level is 'remembering' whereas the apex level is 'creating'. It follows from lowest to highest in this stairway—remembering, understanding, applying, analyzing, evaluating, and creating. This structure is known as Bloom's revised taxonomy.

The new terms are defined as:

Remembering: Retrieving, recognizing, and recalling relevant knowledge from long term memory.

Understanding: Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.

Applying: Carrying out or using a procedure through executing, or implementing.

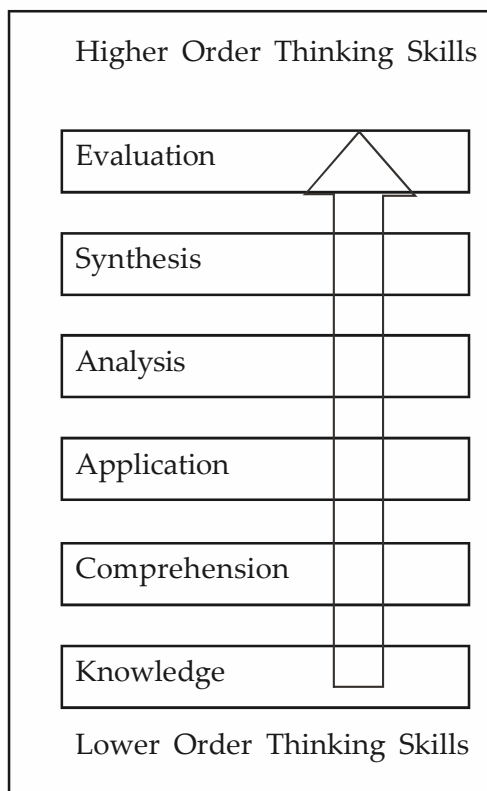
Analyzing: Breaking material into constituent parts, determining how these parts relate to one another and to an overall structure, or purpose through differentiating, organizing, and attributing.

Evaluating: Making judgments based on criteria and standards through checking and critiquing.

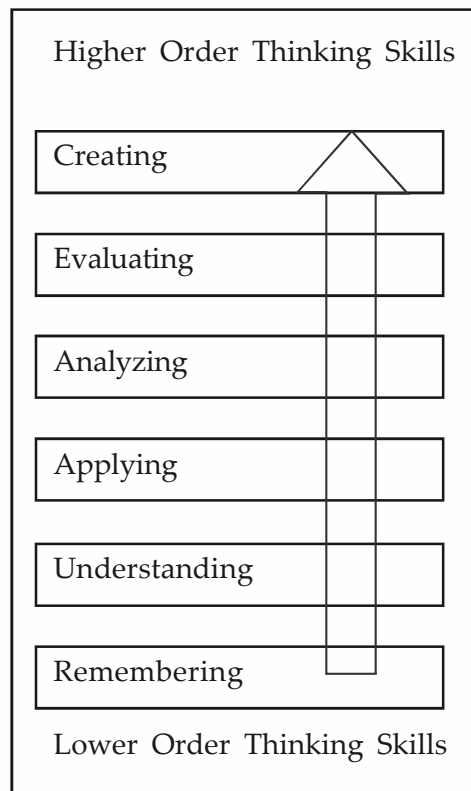
Creating: Putting elements together to form a coherent or functional whole; recognizing elements into a new pattern of structure through generating, planning, or producing.

(Anderson and Krathwohl, 2001, pp.67-68)

Graphical presentations of Bloom's old and revised taxonomy are presented below for your understanding and reference.



(Old Version)



(Revised Version)

Check Your Progress 3

- Notes:** a) Space is given below for your answer.
b) Compare your answer with the one given at the end of this unit.

Write the differences between Bloom's old taxonomy and revised taxonomy?

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Now let us discuss the two important tools 'mind mapping' and 'concept mapping', and discuss their association with cognitive skills in relation to learning and understanding events and concepts.

1.6 MIND MAPPING AND CONCEPT MAPPING

Cognitive skills play a major role to construct mind mapping and concept mapping while studying Self Learning Materials (SLMs). When learners read the SLMs it is expected that they should understand, conceptualize and relate the information to their experiences for better and effective learning. To do so they often require mind mapping as well as concept mapping tools. Let us discuss these tools and see how they help distance learners to make their learning easier and faster.

In mind mapping, it is always found to be a core concept that branches out into some relevant and related sub-concepts. It is presented in a hierarchical or tree format. Again, the sub-concepts further branch out into sub-sub-sub concepts. For example; the concept 'pen' branches out into writing, plastics, ink, paper, etc. Further, the sub-concept 'ink' branches out into blue, green, red, black, etc. Thus, it is stated that mind mapping is a powerful technique that allows learners to make the best use of their brain power by harnessing the full range of their cognitive skills. A mind map can be used either for note taking, or note making. It replaces the inefficient method of linear note-taking and opens up the creative processes and provides a diagram of the whole concept which cannot easily be obtained by any other methods. By using the mind mapping tool, learners can combine words, pictures, icons or symbols, sounds, colors and may be other imagery structures those relevant and fit into organizing their ideas.

Mind maps are also considered as brainstorming diagrams based on a central idea or image, typically used to aid in organization, problem solving, and decision making. A mind map is a graphical way to represent non-linear ideas and concepts. It is a visual thinking tool that helps structuring information, helping learners to better analyze, comprehend, synthesize, recall, and generate new ideas. Mind maps are used to generate, visualize, structure, classify ideas, and as an aid in study, organization, problem solving, decision making, and writing. Mind maps and concept maps are different on the ground that mind maps focus on only one central word or a principal idea whereas, concept maps connect multiple words or ideas together. We will discuss the 'concept mapping' in the next passage and analyze how cognitive skills help to frame the concept map on a particular concept or word. See the pictorial diagram of mind mapping in Figure 1.1.

Example of Mind Mapping

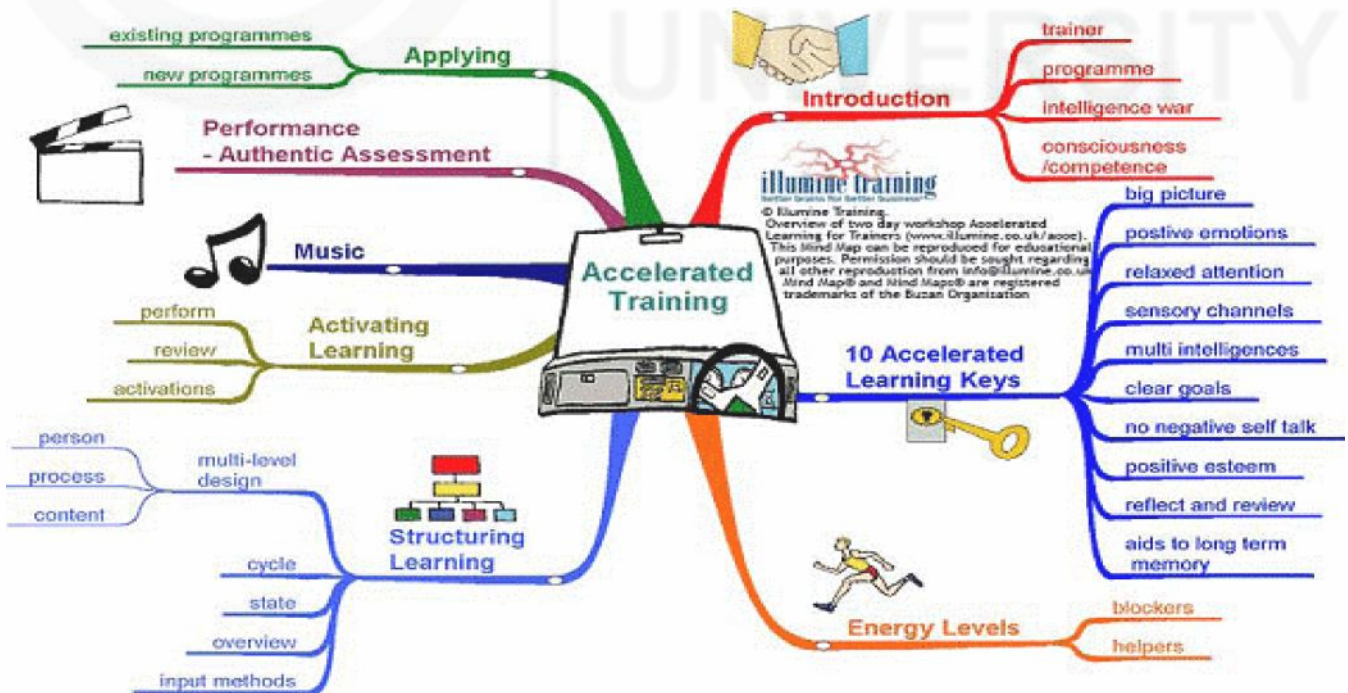


Figure 1.1

Source: <http://www.mind-mapping.co.uk/mind-maps-examples.htm>

Check Your Progress 4

- Notes:** a) Space is given below for your answer.
b) Compare your answer with the one given at the end of this unit.

What is mind mapping?

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Concept Mapping

Concept Mapping is a graphical tool for learning, developed by Novak and Gowin (1984). A concept map is a diagram to show the compact relationships among concepts. They are graphical images for organizing and representing knowledge. A concept map represents the relations between ideas, images, concepts, or words, as a road map represents the locations of highways and towns. In a concept map, each word or concept is connected to another and linked back to the original word, image, or concept. By the help of concept maps learners can develop logical thinking and study skills which are part of cognitive skills. Therefore, concept maps ascertain meaningful learning. To adapt and adhere to the concept mapping tool in learning activities is to learn meaningfully in any context. Thus, learning becomes a unique and creative phenomenon.

See the pictorial diagram of concept mapping in Figure 1.2.

Example of Concept Mapping

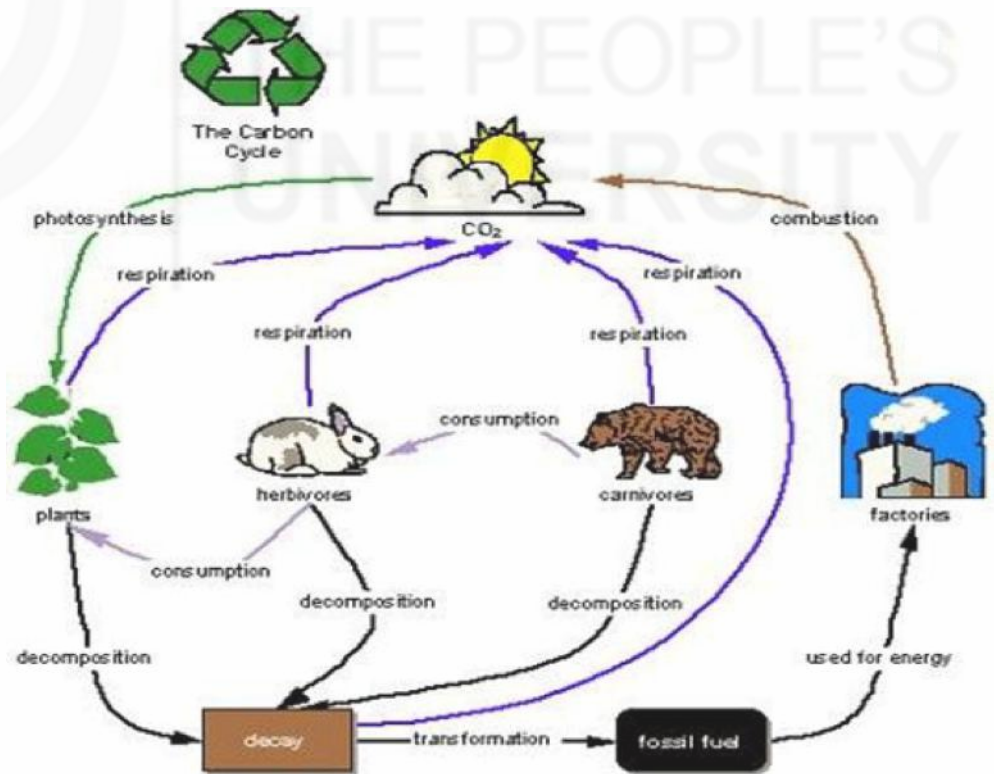


Figure 1.2

Source: <http://www.informationtamers.com/Find-best-visual-form-for-information-management.html>

1.7 LET US SUM UP

Cognitive skills are understood as the basic mental abilities that we use to think, study, and learn. To interpret in the context of distance education, it is regarded as any mental skills that are used in the process of acquiring knowledge.

Cognition is of two types. These are:

- i) Presentative cognition
- ii) Representative cognition (memory)

In presentative cognition, the objects are directly presented whereas in case of representative cognition (memory) the objects are indirectly recalled. All sorts of cognition may not be valid because to have a valid cognition, there should be the right apprehension of an object. In other words, a cognition is valid when knowledge of an object must correspond to the reality. Thus, it states that a valid cognition is the manifestation of an object as it is.

Cognitive skills have some essential components. These are:

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- Rational attitude

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- e) Rote memory: It is a habit to learn and remember certain information

Concentration is of three types: (i) an ability to concentrate on a particular task, (ii) an ability to focus on several important tasks at once, and (iii) an ability to filter irrelevant information and remain focused on a particular task.

To improve one's own concentration, one should adhere to these guidelines:

- a) Ensure understanding of the subject contents
- b) Retain and maintain interest in the subject matter
- c) Have a purpose while doing any activity
- d) Make sure your attention is focused
- e) Transform good procedures into habits
- f) Reward yourselves once you achieve the pre-set goals

Learning through technology certainly has potential benefits provided learners show their inclination for technological use and are acquainted with its multiple applications. In this regard, Cuban (1993) pointed out that the following advantages can be derived by using computer in teaching learning domain:

- to keep the education system at the forefront of technological development and learners' skills up-to-date with those expected in the workforce;
- to increase efficiency and productivity in teaching and learning; and
- to enable more self-directed learning

The revised Bloom's taxonomy is presented in a stairway from lower order thinking to higher order thinking skills: remembering, understanding, applying, analyzing, evaluating, and creating.

The terms are defined as:

Remembering: retrieving, recognizing, and recalling relevant knowledge from long term memory

Understanding: Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining

Applying: Carrying out or using a procedure through executing, or implementing

Analyzing: Breaking material into constituent parts, determining how these parts relate to one another and to an overall structure, or purpose through differentiating, organizing, and attributing

Evaluating: Making judgments based on criteria and standards through checking and critiquing

Creating: Putting elements together to form a coherent or functional whole; recognizing elements into a new pattern of structure through generating, planning, or producing

Cognitive skills play a major role to construct mind mapping and concept mapping while studying self learning materials. When learners read the self learning materials it is expected that they should understand, conceptualize and relate the information to their experiences for the better and effective learning. To do so they often require mind mapping as well as concept mapping tools.

Mind maps and concept maps are different on the ground that mind maps focus on only one central word or a principal idea whereas, concept maps connect multiple words or ideas in together.

1.8 REFERENCES AND FURTHER READINGS

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1.9 FEEDBACK TO CHECK YOUR PROGRESS

QUESTIONS

Check Your Progress 1

The essential components of cognitive skills are:

- Perception
- Memory
- Logical thinking
- Concentration
- Rational attitude.

Check Your Progress 2

There are three types of concentration. These are: (i) an ability to concentrate on a particular task, (ii) an ability to focus on several important tasks at one time, and (iii) an ability to filter irrelevant information and remain focused on a particular task.

Check Your Progress 3

The differences of Bloom's old and revised taxonomy are found in three broad categories: terminology, structure, and emphasis. The major category is prominently marked in the changes as *verb forms instead of nouns*. The old taxonomy has presented the six cognitive levels of thinking in a stairway. These are; knowledge, comprehension, application, analysis, synthesis, and evaluation. But in the revised taxonomy the cognitive levels of thinking are presented in the following hierarchical order—remembering, understanding, applying, analyzing, evaluating, and creating.

Check Your Progress 4

Mind maps are considered also as brainstorming diagrams based on a central idea or image, typically used to aid in organization, problem solving, and decision making. A mind map is a graphical way to represent non-linear ideas and concepts. It is a visual thinking tool that helps structuring information, helping learners to better analyze, comprehend, synthesize, recall, and generate new ideas.



STRIDE

In 1990, The Commonwealth of Learning (COL), Vancouver, Canada, The Asian Development Bank (ADB) and the Ministry of Human Resource Development (MHRD), Government of India, proposed to set up a training institute for Distance Education in South Asia region. Accordingly, the erstwhile Division of Distance Education of the Indira Gandhi National Open University (IGNOU), established in 1986-87, was upgraded into the Staff Training and Research Institute of Distance Education (STRIDE) in 1993. Over the years STRIDE has responded to the Distance Education needs of many countries in Asia, Africa and the Caribbean region.

The objectives of STRIDE are to:

- identify training needs of different target groups already involved and those expected to get involved in open distance education.
- build up a resource base of up-to-date information, training materials, courses and expertise, and make such resources available whenever needed.
- develop training strategies and training materials to meet the various needs of different types of individuals and distance teaching/training institutions.
- organise and conduct training and staff development activities for the identified target groups and institutions through various strategies leading to completion of certificates, diplomas and degrees.
- promote research in Open and Distance Education at the fundamental, experimental and application levels in order to constantly enrich the training programmes and management processes and meet the challenges of the expanding educational environment.
- offer research degree programmes to eligible target group leading to M.Phil and Ph.D degrees.
- respond to the needs of dynamic systems of education and development using information and communication technologies.

Capacity Building Activities organized by STRIDE for:

- IGNOU Teachers/Academics/Non-teaching Staff
- State Open Universities (SOUs)
- DDEs/DEIs (Distance Education Institutes and Dual-mode Universities)
- Collaborated Institutions and Partners
- Overseas Distance Education Institutions and Other International Agencies

“शिक्षा मानव को बन्धनों से मुक्त करती है और आज के युग में तो वह लोकतंत्र की भावना का आधार भी है। जन्म तथा कारणों से उत्पन्न जाति एवं वर्गगत विषमताओं को दूर करते हुए मनुष्य को इन सबसे ऊपर उठाती है।”

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“ Education is a liberating force, and in our age it is also a demonstrating force, cutting across the barriers of caste and class, smoothing out inequalities imposed by birth and other circumstances.”

- Indira Gandhi

STRIDE Activities Academic Programmes

- M.A. (Distance Education)
- M.Phil. in Distance Education
- Ph.D. in Distance Education
- Post Graduate Diploma in E-learning (PGDEL)

Training Programmes (IGNOU/SOU/DEIs/Overseas)

- Induction and orientation programmes
- Specialized training on specific areas
- Self-learning material development (SLMD) workshops
- Refresher programmes in DE and other disciplines
- Staff development Programme for Administrative/Non-teaching Staff
- Training of Academic Counsellors (Face-to-Face)
- Academic Counsellors Training-Online (ACT-Online)
- Training for Developing Research Proposals in ODL
- Research in distance and online learning
- Development of Multi Media Courseware
- Development of Online Courses
- International Customized Training

Research and Programme Evaluation (Studies Completed)

- English as Medium of Instruction in Distance Education (1992)
- Need Analysis for the Programme of Training of Trainers (TOT) in the Developing Self-instructional Material for use in Distance Education in Asia, Africa, South Pacific region (1995)
- A Study on the Utility of MBA Programme of IGNOU as Perceived by Students who successfully completed the Programme (1995)
- A Feedback Study on the Utility of BLISc Programme of IGNOU as Perceived by BLISc Graduates (1995)
- Programme Evaluation in Open & Distance Learning: A Case Study of MADE Programme of IGNOU (1997)
- Exploration of Strategies to Meet the Needs of the Disabled in India (1997)
- Partner Institutions and Students Support Services: Students' Feedback (1999)
- Distance Education and Job Market: A Case Study of IGNOU Graduates (1999)
- Training Need Analysis and Development of a Training Design for Using Distance Learning Methodology for Training Central and State Government Functionaries (1999)
- An Exploratory Study into the use of Activities of Self-instructional Materials by Distance Learners (1999)
- STRIDE Training Programmes: Their Impact on the Distance and Open Learning System in South Asia (1999)
- Freshers in IGNOU: A Study of their Awareness, Interest and Motivation (1999)
- Collaboration and Co-operation among Distance Education Institutions/Open Universities: A Consortium of SAARC Countries (2000)
- Study of Models of Materials Development in Distance Education & Development of Performance Indicators (2000)
- Learning Strategies and Academic Performance: A Study of the Successful Distance Learners of PGDDE Programme of IGNOU (2001)
- The Will to Learn: Counsellors' Perceptions of Academic Counselling (2001)
- Course Evaluation in Open and Distance Learning: A Case Study of PGDHE (ES-302) Course of IGNOU (2002)
- Programme Completion, and Learners Persistence and Dropout in Distance Education (2004)
- Students' Perception of Workload in Distance Education (2004)
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- Student Satisfaction in PGDDE and MADE Programmes of IGNOU (2010)
- Student Satisfaction Survey of IGNOU (2010)
- Programme Evaluation in Distance Education: In-depth Study of Selected IGNOU Programmes (2011)

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