South Valley University
Qena Faculty of Education
Department of Educational Psychology

Lectures on

PRINCIPLES OF PSYCHOLOGY

Educational Psychology Part

For first year students

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Academic Year
2022-2023

Chapter- I
Education and Psychology

Concept of education and psychology

Human life is two aspects the biological and sociological. While the biological aspect of human life is maintained and transmitted by nutrition and reproduction, the social aspect of human life is maintained and transmitted by education (Thamzrzsseri & Masood-Ul-Hassan, 2018: P. 1).

The concept of education is like a diamond which appears to be of a different color (nature) when seen from different angles (point of view or philosophy of life).

The reason for different interpretations/ definitions to education, are:

1- The complex nature of human personality.
2- Complex nature of environment.
3- Different philosophies.
4- Different educational theories and practices.

Chapter I
The Major Branches of Psychology

Psychology is often defined as the study of the mind and behavior, a very broad topic that is often broken down into a number of different branches of psychology. Each branch is centered on a specific subfield within psychology. Some psychologists study the functions of the brain and their influence on behavior. Others explore how personality develops and changes over the course of life. Still other psychologists are interested in exploring how psychology can improve life in the workplace.

How do psychologists think about and study the human mind and behavior? Psychology is such a huge topic and conveying the depth and breadth of the subject can be difficult. As a result, a number of unique and distinctive branches of psychology have emerged to deal with specific subtopics within the study of the mind, brain, and behavior.

Each branch or field looks at questions and problems from a different perspective. While each has its own focus on psychological problems or concerns, all areas share a common goal of studying and explaining human thought and behavior.

Psychology can be roughly divided into two major areas:

1. Research, which seeks to increase our knowledge base
2. Practice, through which our knowledge is applied to solving problems in the real world

Because human behavior is so varied, the number of subfields in psychology is also constantly growing and evolving. Some of these subfields have been firmly established as areas of

interest, and many colleges and universities offer courses and degree programs in these topics.

Each field of psychology represents a specific area of study focused on a particular topic. Oftentimes, psychologists specialize in one of these areas as a career. The following are just some of the major branches of psychology. For many of these specialty areas, working in that specific area requires additional graduate study in that particular field.

What Are the Main Branches of Psychology?

Educationalists focus on the branches that improve the intended learning outcomes (ILOs). In order to understand just how broad and deep of s subject psychology truly is, let's take a closer look at some of the different branches of psychology.

Cognitive Psychology

Cognitive psychology focuses on the scientific study of mind. Cognitive psychologists often study topics such as perception, memory, attention, decision-making, creativity, and problem solving.

This branch of psychology is concerned with looking at mental processes that underlie behavior including thinking, perception, problem-solving, decision-making, memory, and attention.

Cognitive psychology is the branch of psychology that focuses on internal mental states. This area of psychology has continued to grow since it emerged in the 1960s. This area of psychology is centered on the science of how people think, learn, and remember.

Psychologists who work in this field often study things such as perception, motivation, emotion, language, learning, memory, attention, decision-making, and problem-solving. Cognitive psychologists often use an information-processing model to describe how the mind works, suggesting that the brain stores and processes information much like a computer.

Experimental Psychology

Experimental psychology uses the scientific methods to research the mind and behavior. Experimental psychologists work in a wide variety of settings including colleges, research centers, and private businesses.

This branch of psychology is an area concerned with understanding the human condition through the use of experimental methods.

Experimental psychologist conduct research on a wide range of subjects including memory, intelligence, sensation, perception, social behavior, emotions, personality, and much more.

Experimental psychology is the branch of psychology that utilizes scientific methods to research the brain and behavior. Many of these techniques are also used by other areas in psychology to conduct research on everything from childhood development to social issues.

Experimental psychologists work in a wide variety of settings including colleges, universities, research centers, government, and private businesses. Experimental psychologists utilize the scientific method to study a whole range of human behaviors and psychological phenomena.

This branch of psychology is often viewed as a distinct subfield within psychology, but experimental techniques and methods are actually used extensively throughout every subfield of psychology. Some of the methods used in experimental psychology include experiments, correlational studies, case studies, and naturalistic observation.

Personality Psychology

Personality psychology focuses on the study of the thought patterns, feelings, and behaviors that make each individual unique.

Personality psychology studies how different factors such as genetics, parenting, and social experiences influence how personality develops and change: This is large area of psychology interested in the development of personality.

Researchers in this field are interested in understanding the many forces that influence how personality develops and is expressed. They're also interested in learning more about how personality changes over the course of life.

Personality psychology is the branch of psychology that focuses on the study of the thought patterns, feelings, and behaviors that make each individual unique. Classic theories of personality include Freud's psychoanalytic theory of personality and Erikson's theory of psychosocial development. Personality psychologists might study how different factors such as genetics, parenting, and social experiences influence how personality develops and changes.

School Psychology

School psychology focuses on the study of learners' behaviors and emotions at school. School psychologists often study topics such as academic emotions, social issues, and creation of a healthy learning environment.

This field of psychology is devoted to helping students deal with academic, social, emotional, and behavioral issues that they face in school settings. These professionals after work with individual students as well as parents, educators, and school administrators.

School psychology is a field that involves working in schools to help kids deal with academic, emotional, and social issues. School psychologists also collaborate with teachers, students, and parents to help create a healthy learning environment.

Most school psychologists work in elementary and secondary schools, but others work in private clinics, hospitals, state agencies, and universities. Some go into private practice and serve as consultants, especially those with a doctoral degree in school psychology.

Physiological Psychology

Refers to the study of neural mechanisms of perception and behavior.

This branch describes the biological basis of behavior. There is a close relationship between body and mind; the functions of each other are mutually influenced. The functioning of the brain, nervous system, endocrine glands and their relation to cognitive, and affective behavior is explained in this branch of psychology.

Developmental Psychology

Developmental psychology focuses on the study of the development stages of humans across the life span. Developmental psychologists often study topics such as physical growth, intellectual development, emotional changes, … that occur through life.

Human life passes through various stages of development from conception to old age. This branch explains the growth and development of various processes in relation to behavior.

The focus of this branch of psychology is centered on the study of development over the entire course of life. This includes physical, emotional, social, and cognitive growth from the earliest days of infancy into old age. Professionals

who work in this field often specialize in the working with a particular population such as young children, adolescents, or older adults.

Developmental psychology focuses on how people change and grow throughout the entire lifespan. The scientific study of human development seeks to understand and explain how and why people change throughout life. Developmental psychologists often study things such as physical growth, intellectual development, emotional changes, social growth, and perceptual changes that occur over the course of the lifespan.

These psychologists generally specialize in an area such as infant, child, adolescent, or geriatric development, while others may study the effects of developmental delays. This field covers a huge

range of topics including everything from prenatal development to Alzheimer's disease.

Social Psychology

Refers to the study of behaviors within a social context. It focuses on the study of topics such as group behavior, social perception, leadership, nonverbal behavior, and aggression.

Human being is a social animal. Naturally the behavior of an individual is influenced by society and in turn influences the society. Social psychology deals with interrelationships of people among themselves, likes and dislikes of people, attitudes and interests, the prejudices and social distances people have, group behavior, group cohesiveness, group conflicts, etc.

This branch of psychology is interested in how people's thoughts, behaviors, and emotions are influenced by other people. Group behavior, attitudes, aggression, conformity, obedience, persuasion, group dynamics, and attraction are just some of the major areas of interest in social psychology.

Social psychology seeks to explain and understand social behavior and looks at diverse topics including group behavior, social interactions, leadership, nonverbal communication, and social influences on decision-making.

This field of psychology is focused on the study of topics such as group behavior, social perception, nonverbal behavior, conformity, aggression, and prejudice. Social influences on behavior are a major interest in social psychology,

but social psychologists are also focused on how people perceive and interact with others.

Educational Psychology

Focuses on understanding how people learn. Educational psychologists often study topics such as learning, giftedness, instructional process, and individual differences.

This is the most important field where psychological principles are applied. In the field of education ‘learner’ is the focal point. Other aspects like management, teachers, teaching and learning aids are all meant for learners.

Learners differ in their abilities; hence they need different approaches of teaching, learning material, etc. This branch addresses to the problems

and improvement in teaching and learning processes.

This branch of psychology is concerned with this the process of learning. The often involves looking at both behavioral and cognitive methods of learning as well as the motivational, intellectual, and societal factors that impact the learning process.

Educational psychology is the branch of psychology concerned with schools, teaching psychology, educational issues, and student concerns. Educational psychologists often study how students learn or work directly with students, parents, teachers, and administrators to improve student outcomes. They might study how different variables influence individual student outcomes. They also study topics such as learning disabilities,

giftedness, the instructional process, and individual differences.

What is the Importance of Educational Psychology for Teachers?

A teacher acts as a philosopher and a guide to the students. He must know the growth and development of the child and his requirements at different levels. Educational psychology helps the teacher to study the ability, interests, intelligence, needs and adopt different techniques of teaching for effective communication. The utility of educational psychology for the teachers has been emphasized in both theory and practices of teaching and learning.

The importance of educational psychology for a teacher can be divided into two aspects i.e.:

(i) To study teaching and learning situations.

(ii) Application of teaching and learning principles.

(I) To study teaching and learning situations

Educational psychology contributes a lot for increasing the teaching efficiency of the teacher in different areas mentioned below:-

(a) Individual difference

A teacher has to deal carefully with a group of students in class room situation. As there, are wide variations in different abilities among the students. Therefore it is very essential to understand the individual difference of students regarding their ability, interests, attitudes & need at different levels of growth and development.

(b) To know the classroom teaching-learning process

A well developed theory of class room teaching and learning is helpful for transacting the

content to the students effectively, which includes class-room climate and the teaching competence which are required for effective communication and presentation of content. A teacher must know the appropriate principles of teaching-learning, different approaches to teaching for better result of teaching-learning process.

(c) Awareness of effective methods of teaching

The method of teaching is based on the developmental characteristic of the students. For example History is taught effectively to small children with the help of story telling method because small children like stories. So the classroom teaching depends on the teachers' knowledge about the interest of students and methods of teaching for the students of different age-groups.

(d) Curriculum development

The course of study of particular degree or diploma is prepared by teachers. Knowledge of psychology is helpful in developing curricular of different levels of students in different subjects. The developmental characteristics and needs of the students are also taken into account in the formulation of curriculum.

(e) To study mental health of students

In the process of teaching & learning activities in the classroom, mental health of the teacher and the taught plays significant role. As the mental condition influence directly the achievement of students. The mental health of teacher and students must be normal or healthy. There are different causes of mental illness of the teacher and the taught. It should be known to the teachers to regulate teaching – learning process.

(f) Guidance to the students

A teacher has to play different roles in school as guide, philosopher, and leader. Guidance is a type of assistance to the students to solve their problems by themselves. The knowledge of psychology enables the teacher to provide necessary educational and vocational guidance to the students of different age groups.

(g) Measuring learning outcomes

Teacher has to perform two important activities in classroom such as teaching and testing. The testing activities help in measuring learning outcomes of the students to judge their improvement and effectiveness of teaching-learning process.

(II) Application of teaching and learning principles.

(a) Objectives of Education

Education is a purposive attempt to bring about desirable changes in the students behavior. The objectives of education are realized in terms of behavioral changes among the students. Teachers have to create the learning conditions to provide knowledge and experiences to the students for the changes of behavior. They have to relate teaching to learning by appropriate method of teaching.

(b) Use of Audio-Visual aids in teaching

The teacher can take the help of scientific devices. The Topic of presentation in the classroom can be made interesting by involving more students' participation. Television is a more popular device as compared to radio, because television it provides both audio and visual

experiences. Many difficult concepts can be made easy and interesting by the use of audio-visual teaching aids. The knowledge of psychology is necessary to plan and teaching aids appropriately.

(c) Co-curricular activities

Education is to have all-round development of the child. The curricular exercise develops only cognitive aspects of j the child. Therefore other activities like games, sports scouting, girls guiding, debates, cultural programs are essential along with curricular activities for whole some development of the child.

(d) Preparation of time table

The Class-room teaching of various subjects is organized by perfectly arranged time table. Knowledge preparation of time-table needs thoroughly psychology. As the difficulty subjects

like mathematics and science are placed in the first I periods and other subjects like history, geography are usually | taught in the last periods.

(e) Democratic administration

The school and class room administration should also be impartial and democratic. It should provide freedom of expression to the students to explore their innate power. The students problems are to be solved sympathetically through mutual discussion and understanding.

The study of educational psychology is thus very useful for teachers for planning, organizing and evaluating the teaching learning activities in the class.

Chapter II

Learning Process

Introduction

The learning sciences are importantly enriching or understanding of how people learn best. The learning sciences are a rich field of research that has helped us to better understand how we learn. Understanding the fundamentals of how we learn allows us to address more effectively the conditions in which successful learning can occur.

A Definition of Learning

Learning defined as knowledge or skill acquired by instruction or study. Learning defined also as any relatively permanent change in behavior brought about by experience or practice.

Learning is often defined as a relatively lasting change in behavior that is the result of experience. When you think of learning, it might be easy to fall into the trap of only considering formal education that takes place during childhood and early adulthood, but learning is actually an ongoing process that takes place throughout all of life.

How do we go from not knowing something to acquiring information, knowledge, and skills?

Learning became a major focus of study in psychology during the early part of the twentieth century as behaviorism rose to become a major school of thought. Today, learning remains an important concept in numerous areas of psychology, including cognitive, educational, social, and developmental psychology.

One important thing to remember is that learning can involve both beneficial and negative behaviors. Learning is a natural and ongoing part of life that takes place continually, both for better and for worse.

Sometimes people learn things that help them become more knowledgeable and lead better lives. In other instances, people can learn things that are detrimental to their overall health and well-being.

The process of learning new things is not always the same. Learning can happen in a wide variety of ways. To explain how and when learning occurs, a number of different psychological theories have been proposed.

The gatekeepers of learning : Emotion and Motivation

Dumont et al (2012) suggest that there are two primary 'gatekeepers' to learning: Emotion and Motivation.

Emotions are the primary gatekeeper to learning. Emotion and cognition operate seamlessly in the brain to guide learning. Positive emotions encourage, for instance, long-term recall while negative emotions can disrupt the learning process in the brain-at times leaving the student with little or no recall after the learning event.

So, the first gatekeeper, the emotional state of a student, directly affects their ability to learn. If a student is engaged in learning within an environment that promotes a positive state of emotion, they will be better able to utilize long-term recall, for example. Conversely, a poor

emotional state will disrupt their ability to learn or to be able to recall information from the lesson at a later time.

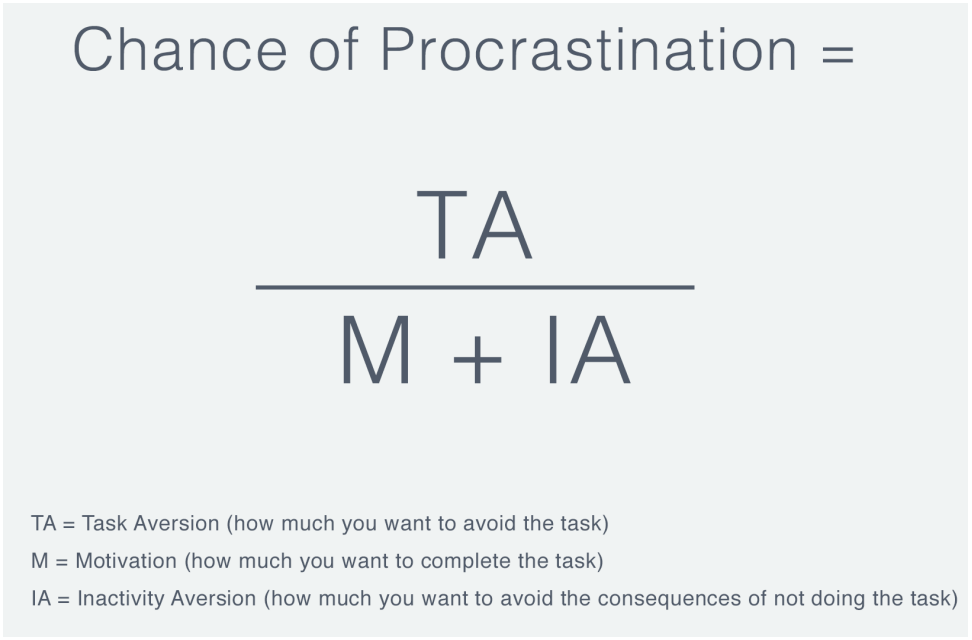
While the emotional state of students can depend upon factors outside of the classroom, educators can seek to provide a learning environment that helps facilitate a positive experience for each student and therefore increase their ability to learn.

Examples of Learning Emotions

Academic Procrastination

Procrastination affects millions of people and is a detrimental problem which frequently affects individual productivity and well-being.

Academic procrastination is a serious problem in the educational environment, and the causes of its emergence have long been of interest to psychologists. Academic procrastination, largely regarded as a bad habit, is an important issue that has been of interest to many researchers in recent years, and is seen as a behavioral problem that many adults experience in their regular work, especially in tasks that must be done in a certain time period. Procrastination on academic tasks is a common problem among middle school students and college students, and it is one of the most significant causes of students' failure to learn and to achieve academic success.



Academic Boredom

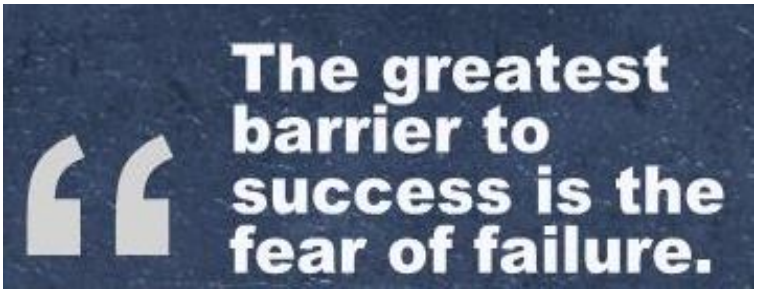
The impact of academic boredom on learning and achievement has received increasing attention

in the literature because academic boredom is associated with lower academic outcomes.

Fear of Failure in Learning

Fear of failure has been defined as "persistent and irrational anxiety about failing to measure up to the standards and goals set by oneself or others". Failure fearers tend to be anxious, high in self-doubt, and are uncertain about their ability to avoid failure or achieve success. While these students may work hard and achieve, they tend to be adversely affected by setback as it tends to confirm their doubts about their ability and their uncertain control. Often in response to this fear of failure, these students may actively sabotage their chances of success (e.g., procrastinate, leave tasks until the last minute, or expend little effort) so that they have an excuse if they do not do so well. This excuse serves a protective function in that they can

blame their poor performance on their procrastination, for example, rather than a possible lack of ability.



Academic Anxiety

Academic anxiety is described as a feeling of distress, fear or extreme stress as a result of school pressures. This anxiety isn't your typical stress before a final exam, but rather a more disruptive pattern of high stress in you.

Academic anxiety has four components – worry, emotionality, task-generated interference, and study skills deficits.

One of the component is related to worries. Worries are the thoughts that prevent you from focusing on and successfully completing academic work. For example predictions of failure, self-degrading thoughts, or preoccupation with the consequences of doing poorly. Some effective techniques for managing this component include: using positive mental imagery, disputing negative and self-defeating thoughts with more productive, realistic thoughts, and self-hypnosis.

The second one is emotionality; emotionality is a biological symptom of anxiety. For example, fast heart-beat, sweaty palms, muscle tension. The most effective strategies for dealing with emotionality are muscle and breathing relaxation exercises.

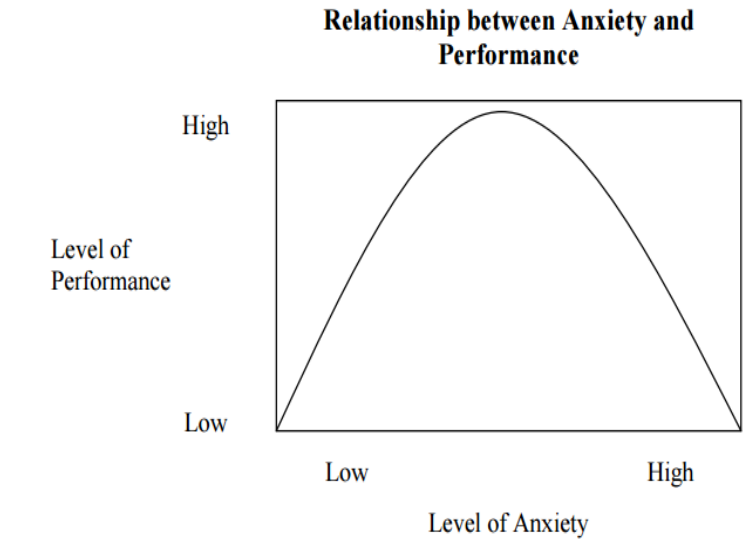
The third one is task generated interference, such behavior is related to the task at hand, which is unproductive and prevent successful performance. For example, constantly checking the clock during an exam, or spending a lot of time on a test question you cannot answer. Since these behaviors can take on many forms, the best management technique is to work with a study skills instructor or a counselor to identify the specific behaviors that cause problems and create a plan to reduce or change them.

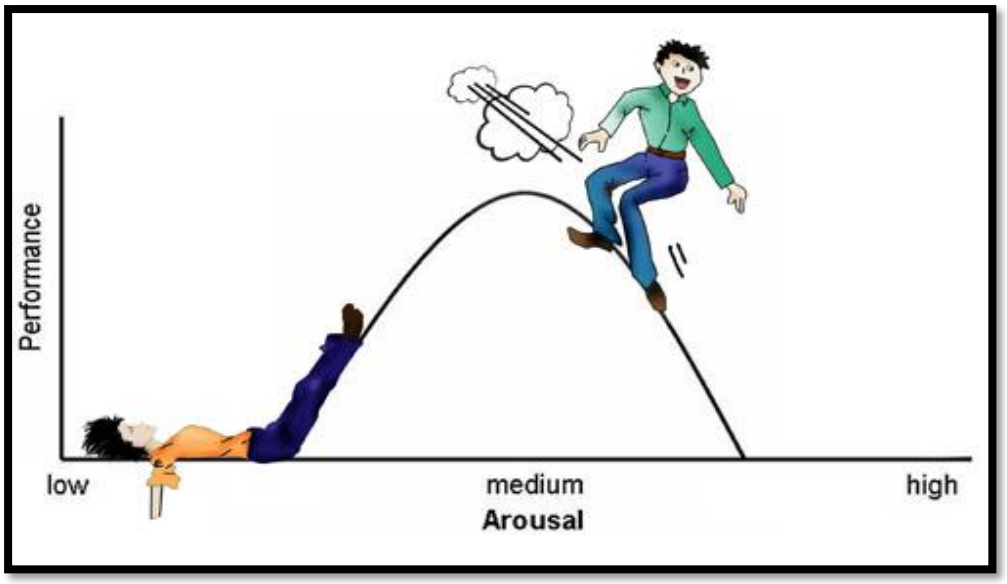
The last one is study skills deficit; It includes the problems of study methods which create anxiety. For example, last-minute cramming resulting in not knowing answers to test questions or poor note-taking during lecture resulting in confusion about a major assignment. Many students experience the first three components of academic

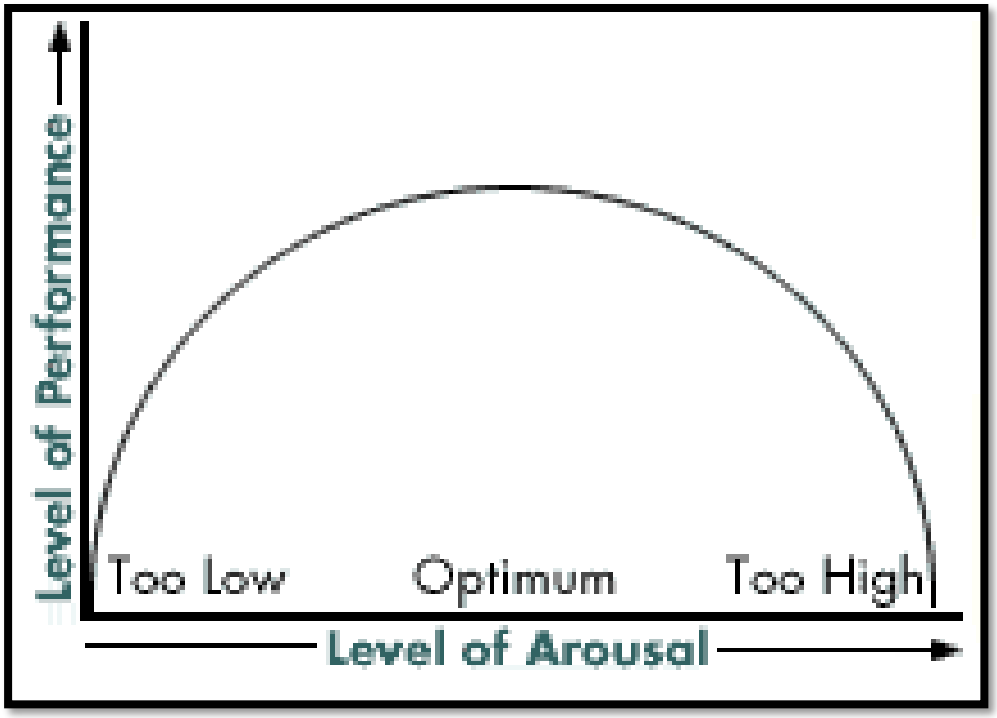
anxiety as a result of study skills deficits. If this is the case, then your grades will not improve unless study skills are addressed. A study skills instructor can help you with this.

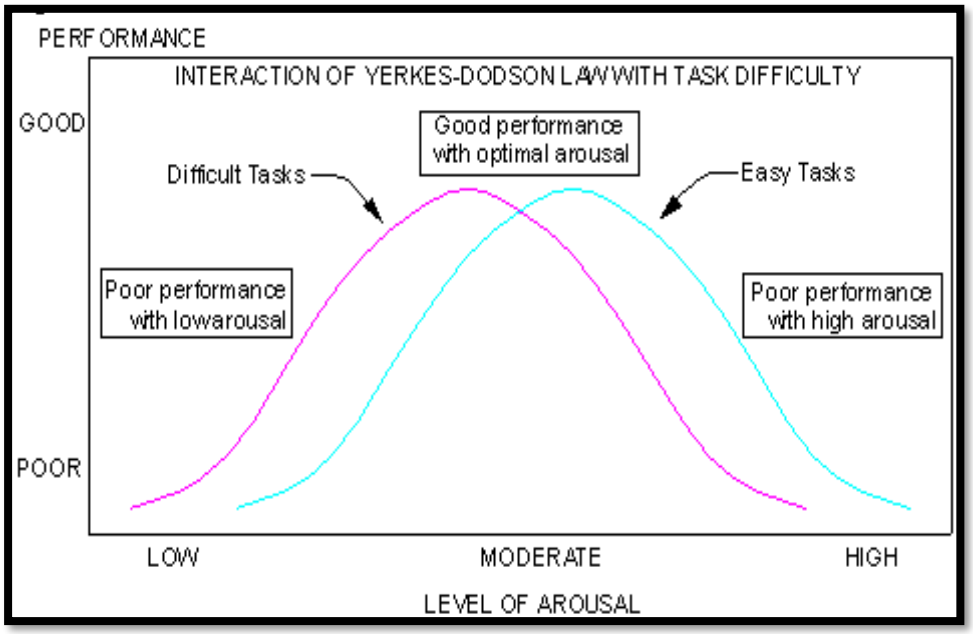
Any anxiety disorder, whether it be social, academic or generalized can lead to these problems: Impaired ability to perform tasks and trouble concentrating, Disturbed sleep, Decreased energy, Depression, Substance abuse, and Headaches.

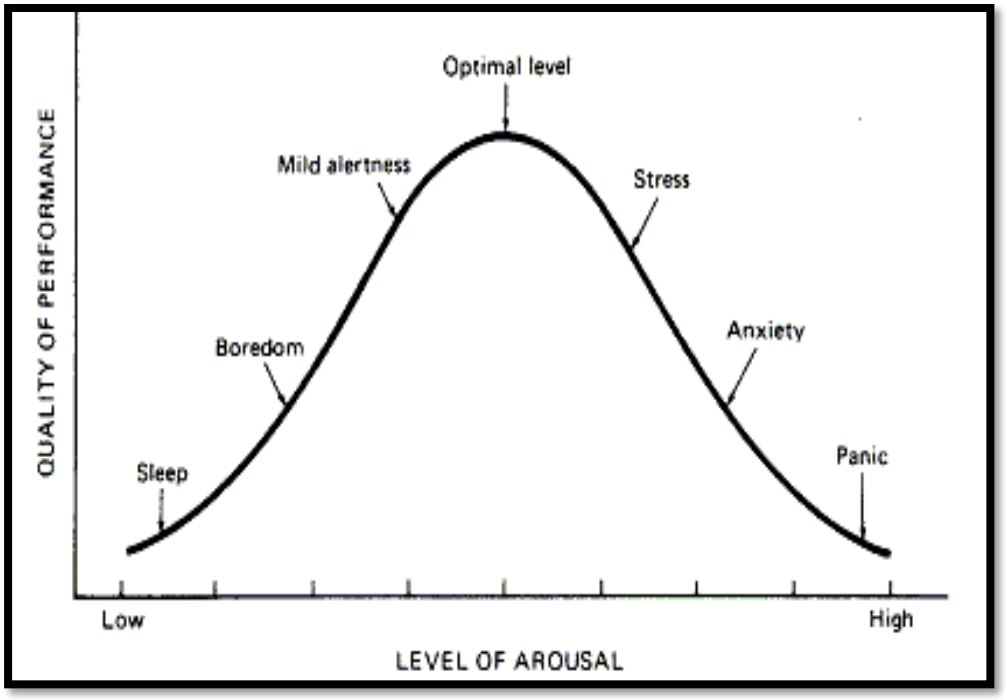
The optimal level of anxiety you need to perform well:






Level of Performance
Too Low
Optimum
Too High
Level of Arousal


PERFORMANCE
INTERACTION OF YERKES-DODSON LAW WITH TASK DIFFICULTY
GOOD
POOR
Good performance with optimal arousal
Difficult Tasks
Easy Tasks
Poor performance with lowarousal
Poor performance with high arousal
LOW
MODERATE
HIGH
LEVEL OF AROUSAL



Academic Frustration

Students who are confused may quickly become frustrated in the classroom if they are pressured to perform. It may be the case that attention or processing difficulties have prevented a learner from understanding a lesson, or that the instructions for a particular assignment are not clear to them.

In some cases motor skills difficulties, such as problems with handwriting, prevent a child from demonstrating their knowledge.

When cognitive ability and creativity are present but productive and receptive language skills are compromised, such as by dyslexia, a child may feel frustrated with underperformance and/or a lack of progress.

Frustration can arise when a student works in a particular subject area. Some learners may become frustrated in English class whereas others find following the steps in math problems frustrating.

Frustration may also be related to students having high expectations for performance, such as

wanting to get every answer correct or produce error-free writing that doesn't need revisions.

There may be more than one reason why students feel frustrated and no two learners will be helped by exactly the same strategies. The important thing is for teachers to assess whether the frustration is temporary or has become a long-term problem.

That's because over time, frustration can cause students to lose motivation. It can lead to heightened anxiety, a lack of confidence, low self-esteem and a negative attitude towards school and learning.

Helping students deal with frustration

Regardless of its source, the reaction teachers and parents take to a child who is experiencing

frustration is key. Every student will feel frustrated at some point or another in his or her life.

By modeling healthy ways of dealing with frustration, students are more likely to be able to self-soothe in the future.

You may try teaching strategies such as reminding a frustrated student to stay calm, talk through the problem, and evaluate all of their options, which can require getting some distance and perspective on an issue.

However, when a child experiences chronic frustration, it can be a sign that a specific learning difficulty is getting in the way of their ability to learn or achieve success at school.

What does frustration look like?

Physical signs

Teachers might witness physical signs such as labored breathing, teeth grinding or clenched fists. Students may have sweaty palms and bear down excessively when writing with a pen or pencil.

Emotional signs

Students experiencing frustration may be more emotional. They can be quick to anger or may appear defensive about receiving help. In some cases frustration can cause a student to act out towards teachers and peers.

In the classroom

Some students will pace around and have difficulty staying in one place. They may walk away from their desk, close their books (or refuse to open them in the first place) or even throw a writing instrument or paper.

7 Ways to help students cope

1. Teach them to acknowledge how they're feeling. Sometimes just recognizing the frustration they are feeling and counting to ten can help alleviate some of the related stress and anxiety. Everyone gets frustrated from time to time and there is no shame in being open about this. Teachers may share an example of a task that frustrated them and explain the strategies they used to deal with their feelings.

2. Model physical techniques that can calm emotions. Provide training on meditative techniques, including modeling deep and slow breathing that can help release tension and reinstate calm. A brief walk or some light stretching can also make a difference.

Frustration is often lower when a student is more relaxed.

3. Ensure they have had a good night's sleep. Frustration can set in quickly when a student is over-tired, hungry or physically unwell because of illness. Make sure they have their basic physical needs met before they sit down to learn something new or attempt cognitively taxing school work.

4. Remind them it's temporary. Frustration can cause students to place too much emphasis on the completion of a task. Teachers may remind them frustration will pass and that it's not worth getting upset about. Staying positive is key.

5. Get them to step back and re-evaluate the problem. Students may feel frustrated with one aspect of a problem, but upon stepping back can gain much needed perspective. You might suggest they work on a separate part of the assignment or switch to a different task completely for a period of time. This will make it easier to come up with new approaches when they return to the original task.

6. Suggest alternative ways to complete the assignment. If the way in which the work must be done is causing the frustration, teachers may want to suggest alternative ways of engaging with learning or demonstrating knowledge. For example, if the task is to develop a written report, you may change it to

bullet points or an oral presentation instead.

7. Help them build up their confidence. Have students do something they're good at – so they build up their confidence and feel more capable again. This may be a task with a lower challenge level or something they have a passion for. Teachers could interrupt a task to or have students do a confidence boosting exercise before beginning an assignment that is likely to cause frustration.

It can also help to have a teacher, tutor or parent work closely with the student to discover the source of their frustration. Starting at the beginning and going step-by-step through the problem together will tell you a lot about why the student feels frustrated and when the frustration sets in –

you can then come up with more targeted solutions for alleviating it.

Teaching specific problem-solving strategies may be called for – just ensure this teaching happens at the right moment. This is preferably not when students are frustrated because they will be less able to learn and retain the new strategies.

Motivation

Like emotion, the presence of positive motivation towards a learning task markedly increases the likelihood that students will engage in deep learning.

Dumont et al propose that the role of the teacher should include providing the time, space and support for student reflection to determine the usefulness of learning strategies, as well as to provide positive support for those students who may have had negative learning experiences. In other words, teachers need to identify students' interests and help them to foster intrinsic motivation.

The 8 Basics of Motivation

Students are more motivated to engage in learning when they:

- they perceive stable links between specific actions and achievement.
- they feel competent to do what is expected of them.

- they value the subject and have a clear sense of purpose.
- They perceive the environment as favorable for learning.
- They experience positive emotions towards learning activities.
- Students direct their attention away from learning when they experience negative emotions.
- Students are more persistent in learning when they can manage their resources and deal with obstacles efficiently.
- Students free up cognitive resources for learning when they are able to influence the intensity, duration and expression of their emotions.

The 7 Principles of Learning

1- Learners at the centre

Learning activities should focus on cognition and growth while allowing students to construct their learning through engagement and active exploration. This calls for a mix of pedagogies, which might include guided and action approaches, as well as cooperative, inquiry-based, and service learning. The aim is to develop self-regulated learners.

The learning environment recognizes the learners as its core participants, encourages their active engagement and develops in them an understanding of their own activity as learners.

2- The social nature of learning

We learn through social interaction, meaning learning environments should be highly social. Co-operative group learning that is well-organized and challenging has clear benefits for achievement, as

well as behavioral and affective outcomes. Opportunities for autonomous learning should increase as students mature.

The learning environment is founded on the social nature of learning and activity encourages well-organized co-operative learning.

3- Emotions are the Gatekeeper (Integral) to learning

Learning results from the dynamic interplay of emotion, motivation and cognition. Attention to motivations by all those involved is about making learning more effective - better still if it also makes learning more enjoyable.

The learning professionals within the learning environment are highly attuned to the learners'

motivations and the key role of emotions in achievement.

4- Recognizing individual differences

Students differ in many ways that are fundamental to learning: prior knowledge, ability, conceptions of learning, learning strategies, interest, motivation, self-efficacy, beliefs and emotion; they differ also in socio-environmental terms such as linguistic, cultural and social backgrounds. Flexible learning environments are adaptive to individual learners in ways that are sustainable for both individuals and the group as a whole.

The learning environment is acutely sensitive to the individual differences among the learners in it, including their prior knowledge.

5- Stretching (Challenging) all students

Being aware of individual differences and needs means being able to constantly challenge learners, no matter what their starting point, to move out of their comfort zone without overloading or excessively pressuring them.

The learning environment devises programs that demand hard work and challenge from all but without excessive overload.

6- Meaningful feedback (Assessment) for learning

The learning environment clearly communicates what is expected from learners, what they are doing and why. Formative assessment should be substantial, regular and provide

meaningful feedback. This should be used to constantly shape direction and practice in the learning environment.

The learning environment operates with clarity of expectations using assessment strategies consistent with these expectations; there is a strong emphasis on formative feedback to support learning.

7- Building horizontal connections

Learning should promote connectedness by supporting students to make connections across knowledge and subjects as well as across the community and the wider world. The authentic learning this promotes helps to foster deeper understanding.

The learning environment strongly promotes horizontal connectedness across of knowledge and subjects as well as to the community and the wider world.

Chapter III

Cognitive Processes

What is cognition?

Cognition is the process of acquiring and understanding knowledge through our thoughts, experiences, and senses.

Cognition is a term referring to the mental processes involved in gaining knowledge and comprehension. These processes include thinking, knowing, remembering, judging and problem-solving. These are higher-level functions of the brain and encompass language, imagination, perception, and planning.

Sensation

Sensation is input about the physical world obtained by our sensory receptors. What does it

mean to sense something? Sensory receptors are specialized neurons that respond to specific types of stimuli. When sensory information is detected by a sensory receptor, sensation has occurred. For example, light that enters the eye causes chemical changes in cells that line the back of the eye.

Attention

Attention plays a significant role in determining what is sensed versus what is perceived. It is the process of selectively concentrating on a discrete aspect of information, whether deemed (considered) subjective or objective, while ignoring other perceivable information.

There are two major types (Basic Forms) of attention: Full attention and divided attention.

Full attention means complete focus on a specific stimulus regardless of others. But the

divided Attention is describes the mental state where people try to focus on multiple things.

Perception

Perception is the process by which the brain selects, organizes, and interprets these sensations. Also, defines as the organization, identification, and interpretation of sensory information in order to represent and understand the environment.

While our sensory receptors are constantly collecting information from the environment, it is ultimately how we interpret that information that affects how we interact with the world. Perception refers to the way sensory information is organized, interpreted, and consciously experienced. Perception involves both bottom-up and top-down processing. Bottom-up processing refers to the fact that perceptions are built from sensory input. On

the other hand, how we interpret those sensations is influenced by our available knowledge, our experiences, and our thoughts. This is called top-down processing.

Senses are the physiological basis of perception. Perception of the same senses may vary from one person to another because each person's brain interprets stimuli differently based on that individual's learning, memory, emotions, and expectations.

Perception can be split into two processes:

1. Processing sensory input that transforms this low level information to higher level information. (sensation)
2. Processing which is connected with person's concept and expectations and attention that influence perception. (attention)

Remembering

Remembering is the act of remembering what we have learnt through recalling or recognition.

Recalling is the ability to remember things we learnt in the past without the existence of the original stimulus.

Recognition is the ability to remember things we learnt in the past with existence of the original stimulus.

Stages of remembering

1. Students try to memorize what they have studied,
2. Students try to keep what they have memorized, and

3. Students try to recall what they have memorized and kept.

Forgetfulness: it is the opposite of remembering, is the apparent loss or modification of information already encoded and stored in an individual's long-term memory.

Cognitive psychologist Margaret W. Matlin has described memory as the "process of retaining information over time." Others have defined it as the ability to use our past experiences to determine our future path.

Memory is essential in our everyday lives. We would not be able to function in the present or move forward without relying on our memory.

Memory is the means by which we draw on our past experiences in order to use this information in the present (Sternberg, 1999).

Memory is the term given to the structures and processes involved in the storage and subsequent retrieval of information.

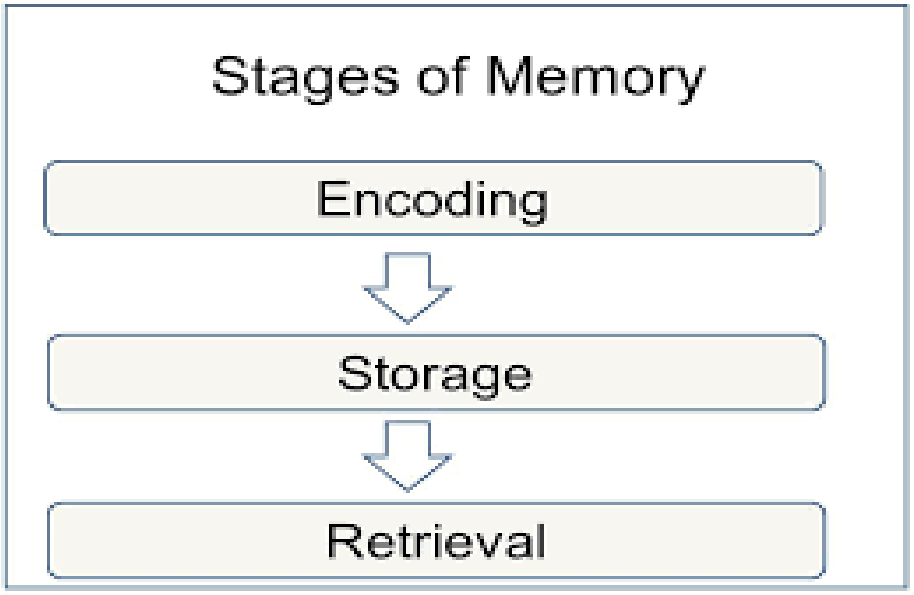
Memory is essential to all our lives. Without a memory of the past, we cannot operate in the present or think about the future. We would not be able to remember what we did yesterday, what we have done today or what we plan to do tomorrow. Without memory, we could not learn anything.

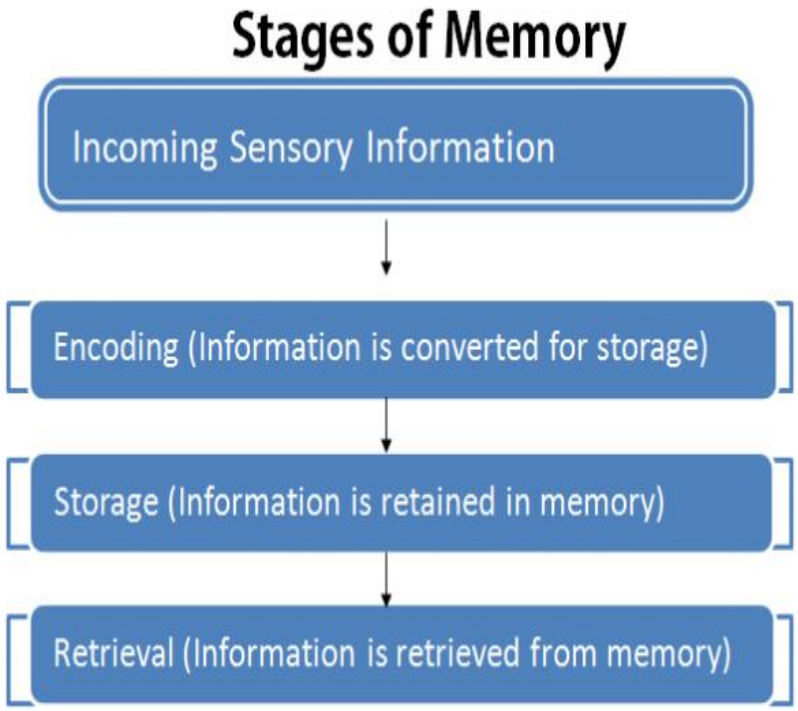
Memory is our ability to encode, store, retain and subsequently recall information and past experiences in the human brain. It can be thought

of in general terms as the use of past experience to affect or influence current behavior.

Memory is involved in processing vast amounts of information. This information takes many different forms, e.g. images, sounds or meaning.

For psychologists the term memory covers three important aspects of information processing:





1. Memory Encoding

When information comes into our memory system (from sensory input), it needs to be changed into a form that the system can cope with, so that it can be stored. Think of this as similar to changing your money into a different currency when you travel from one country to another. For example, a word which is seen (in a book) may be stored if it is

changed (encoded) into a sound or a meaning (i.e. semantic processing). There are three main ways in which information can be encoded (changed):

1. Visual (picture)
2. Acoustic (sound)
3. Semantic (meaning)

Evidence suggests that this is the principle coding system in short-term memory (STM) is acoustic coding. When a person is presented with a list of numbers and letters, they will try to hold them in STM by rehearsing them (verbally).

Rehearsal is a verbal process regardless of whether the list of items is presented acoustically (someone reads them out), or visually (on a sheet of paper).

The principle encoding system in long-term memory (LTM) appears to be semantic coding (by

meaning). However, information in LTM can also be coded both visually and acoustically.

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2. Memory Storage

This concerns the nature of memory stores, i.e., where the information is stored, how long the memory lasts for (duration), how much can be stored at any time (capacity) and what kind of information is held.

The way we store information affects the way we retrieve it. There has been a significant amount of research regarding the differences between Short Term Memory (STM) and Long Term Memory (LTM).

Most adults can store between 5 and 9 items in their short-term memory. Miller (1956) put this idea forward and he called it the magic number 7.

He though that short-term memory capacity was 7 (plus or minus 2) items because it only had a certain number of “slots” in which items could be stored.

However, Miller didn’t specify the amount of information that can be held in each slot. Indeed, if we can “chunk” information together we can store a lot more information in our short-term memory. In contrast, the capacity of LTM is thought to be unlimited. Information can only be stored for a brief duration in STM (0-30 seconds), but LTM can last a lifetime.

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3. Memory Retrieval

This refers to getting information out storage. If we can’t remember something, it may be because we are unable to retrieve it. When we are asked to

retrieve something from memory, the differences between STM and LTM become very clear.

STM is stored and retrieved sequentially. For example, if a group of participants are given a list of words to remember, and then asked to recall the fourth word on the list, participants go through the list in the order they heard it in order to retrieve the information.

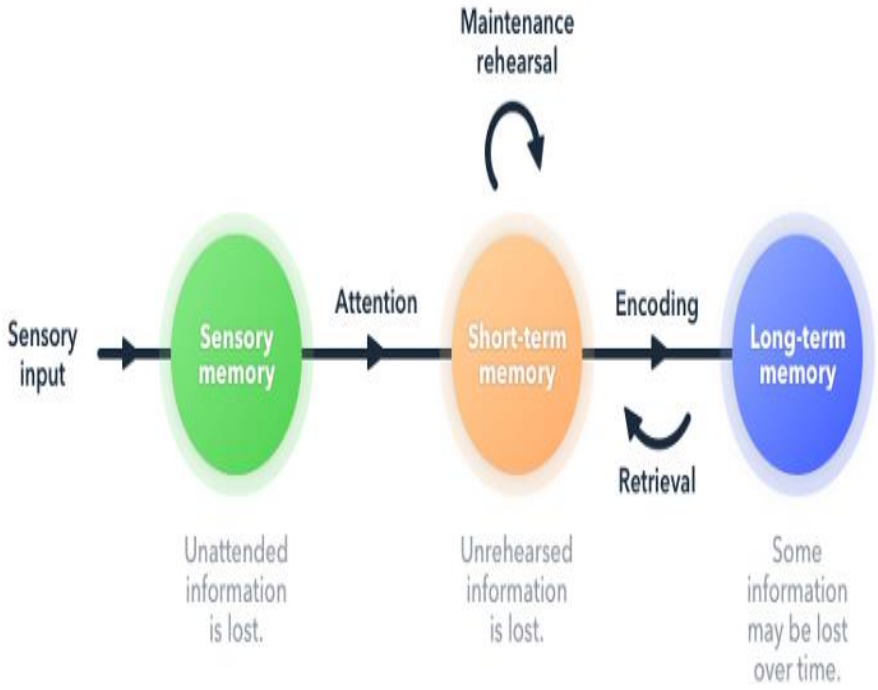
LTM is stored and retrieved by association. This is why you can remember what you went upstairs for if you go back to the room where you first thought about it.

Organizing information can help aid retrieval. You can organize information in sequences (such as alphabetically, by size or by time). Imagine a patient being discharged from hospital whose

treatment involved taking various pills at various times, changing their dressing and doing exercises. If the doctor gives these instructions in the order which they must be carried out throughout the day (i.e., in the sequence of time), this will help the patient remember them.

Why teachers need to understand how memory works

No matter how engaging a teacher, if they are not able to make the information they teach enter the long-term memories of their students, those students will end up having learnt very little.



Using the memory model above, we can see that depending on how the information is processed by students in their short-term memory, it may or may not be moved into long-term memory for storage and later use.

How is the selection made for which information is processed? Even if the students in are taking notes and paying attention in class, thus

processing information in their short-term memories, this still does not guarantee that they will have retained much, if anything, by the end of the lesson. In other words, that information won't necessarily enter their long-term memory.

Instead, how much is retained and learnt will mostly depend on how far a student was able to meaningfully link the new information in their short-term memory to what they already knew (what was in their long-term memory). This linking process is called active learning. It is this dialogue between working memory and long-term memory that will make and store memories of this new learning. Thus, if a student mostly listens and/or watches in a learning environment, without being given the chance to actively process this new information, it is unlikely to be stored in the form of new and usable memories, no matter the

student’s level of interest, because most of their thinking and processing will take place solely in short-term memory, which is soon lost. This is, unfortunately, too often what ends up happening in school, when students are neither encouraged nor required to actively process what they are meant to be learning.

Indeed, it is precisely because long-term memory is such a complex component of our memory system that, as educators, it is critically important to understand the basics of its functioning.

No matter how engaging a teacher or how willing the students, without integrating concepts of active learning into teaching practices, it is unlikely students will be able to apply essential concepts and skills anywhere beyond the classroom.

In subsequent articles, we'll have a look at some teaching and studying practices teachers can apply to their classes to improve students' retention of information, as well as other aspects of the classroom that can affect active learning.

How to enhance remembering? (Selected strategies)

1. have clocks and calendars so you can stay oriented to time and date.
2. keep things organized via write a to – do – list and check off items as you do them .
3. develop habits and routines that are easy to follow.
4. keep your mind active via read a lot, if you have trouble remembering things, keep a suitable resources available.

10 Tips

1. Creating a Study Plan
2. Taking Study Breaks
3. Building Own Study Notes
4. Getting Enough Sleep
5. Asking Questions
6. Testing yourselves Regularly
7. Enhancing your Learning based on your Mistakes
8. Practicing Under Test Conditions
9. Applying Learning to Real-life
10. Following What you Love

Chapter IV

Intelligence : An Introduction

Introduction

Intelligence is one of the broadest topics in psychology and education.

Intelligence and learning are two of the most central topics in psychology and education.

Intelligence and learning are two of the best investigated topics of psychology in the last 100 years. They are "hypothetical constructions", that means they are note directly perceptible.

What is Intelligence? (Some Classic Definitions)

- Spearman (1904)

- A general ability which involves mainly the education of relations and correlates.

- Binet & Simon (1905)
- The ability to judge well, to understand well, to reason well.

- Terman (1916)
- The capacity to form concepts and grasp their significance.

- Thurstone (1921)

The capacity to inhibit instinctive adjustments, flexibly imagine different responses, and realize modified instinctive adjustments into overt behavior.

- Wechsler (1939)

- the global capacity of the individual to act purposefully, to think rationally, and to deal effectively with the environment.

- Sternberg (1985)
- the mental capacity to automatize information processing and to emit contextually appropriate behavior in response to novelty; intelligence also includes meta-components, performance components, and knowledge-acquisition components

- Gardner (1986)
- the ability or skill to solve problems or to fashion products which are valued within one or more cultural settings .

Stanford-Binet Intelligence Scale

Developed by L.M. Terman of Stanford University. First time the concept of "intelligence quotient" was used:

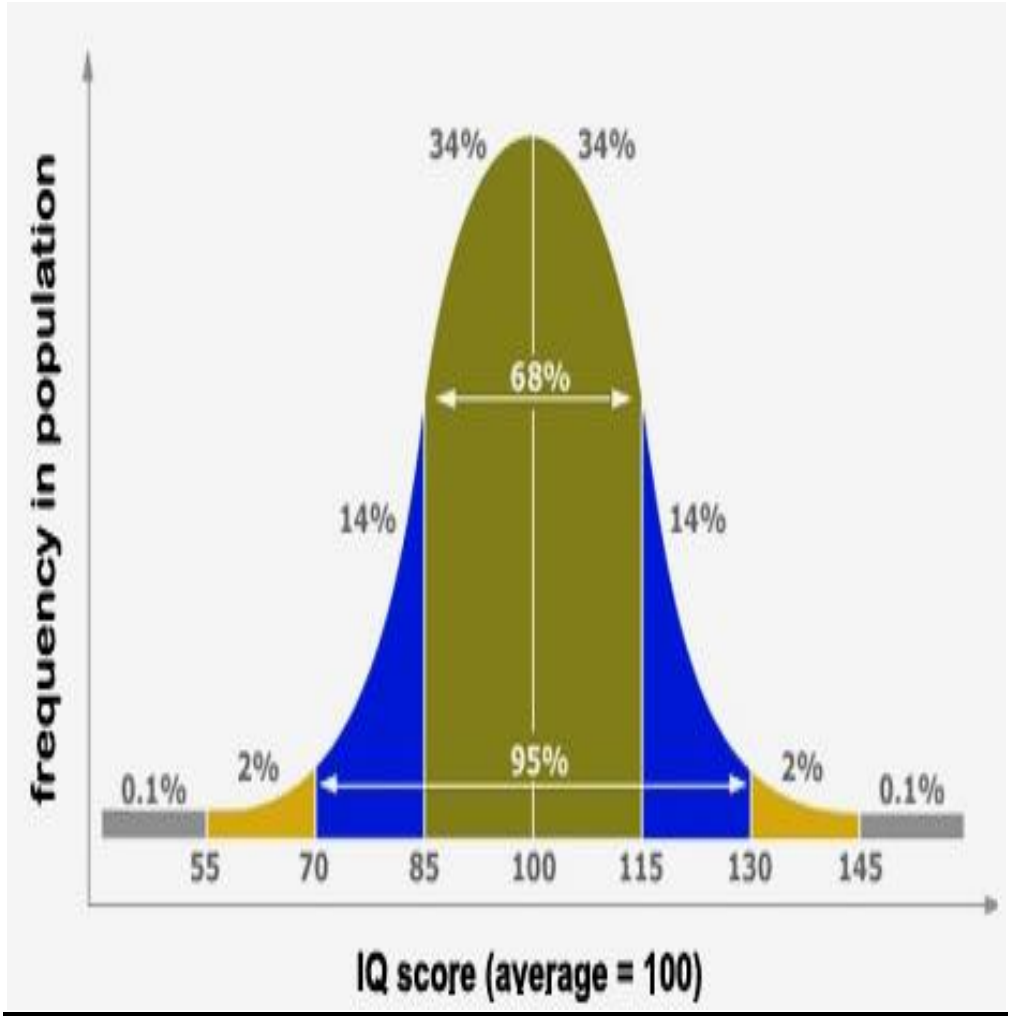
$$IQ = \frac{\text{Mental Age (MA)}}{\text{Chronological Age (CA)}} \times 100$$

$$IQ = \frac{MA}{CA} \times 100$$

What is IQ?

- IQ stands for intelligence quotient.
- IQ is a normally distributed characteristic which means that if you graph how many people get which score, you will come up with a bell-shaped curve. The highest point of the curve will be over the score 100, which is the average IQ. Statistically speaking, 68% of the

people will score between 85 and 115 on IQ test.



Binet Scale of Human Intelligence		
IQ Score	Original Name	Modern Term
Over 145	Genius	
130 - 144	Superior	
120 - 129	Bright or Smart	
110 - 119	High Average	
90-109	Average or Normal	
80 - 89	Low Average	
70 - 79	Borderline Impaired	Delayed
55 - 69	Mildly Impaired	
40 - 54	Moderately Impaired	Severe
Below 20	Mental Retardation	Profound

Famous IQs

- Albert Einstein 190 or 160+
- Bill Gates 173 or 160
- Norman Schwarzkopf 170
- Marilyn Monroe 163

- Mahatma Gandhi 160
- Richard Nixon 143
- Charlie Chaplin 140
- Bill Clinton 140
- Madonna 140
- Shakira 140
- Arnold Schwarzenegger 135
- Nicole Kidman 132+
- Walt Disney 123
- IQ 170
- Andrew J. Wiles (Mathematician; solved Fermat's Last Theorem)
- IQ 190
- Philip Emeagwali (Extrapolated; Nigerian Mathematician)
- Stephen W. Hawking (160+) (Physicist)

Intelligence Theorists

1. Charles Spearman (1 intelligence- g factor).
2. Raymond Cattell (2- fluid & crystallized).
3. L. L. Thurstone (multiple factors-7 clusters).
4. J. P. Guilford (180 abilities).
5. Howard Gardner (multiple intelligences – 7 frames of mind).
6. Robert Sternberg (3-Triarchic Theory).

Intelligence and achievement

A great body of research in psychology and education showed that they are highly correlated.

Achievement vs. Intelligence

Achievement- knowledge and skills gained from experience. Things you know and can do. Intelligence- abilities to learn from experience, think rationally, and to deal effectively with others and environment. Intelligence makes achievement possible.

References

Andreasen, E (1999) Human Brain Mapping, 8(4), 226-234. Wiley-Liss, Inc. Iowa City, Iowa.

Ashby, C. R., Thanos, P. K., Katana, J. M., Michaelides, E. L., Gardner, C. A., Heidbreder, N. D. (1999) The selective dopamine antagonist. Pharmacology, Biochemistry and Behavior.

Christianson, S.A. (1992). Emotional stress and eyewitness memory: A critical review. Psychological Bulletin, 112(2), 284-309).

Chugani H (1998) Biological Basis of Emotions: Brain Systems and Brain Development. Pediatrics 102:1225-1229

Culatta, R. (2012, July 10) Personalizing Learning. U.S. Department of Education. Retrieved from https://www.ed.gov/teaching/summerseminars

Dulay, H. and M. Burt. 1977: “Remarks on creativity in language acquisition”. In Viewpoints on English as a second Language. (Ed.) M. Burt , H. Dulay and M. Finocchiaro. New York. Regents.

Dumont, H., Istance, D., & Benavides, F. (2010) The Nature of Learning: Using Research to Inspire Practice, OECD Innovative Learning Environments Project, pp.91-107.

Dumont, H., Istance, D., & Benavides, F. (2012) The Nature of Learning: Using Research to Inspire Practice,

OECD Innovative Learning Environments Project, p.4.

Introini-Collision, I.Bl, Miyazaki, B., & McGaugh, J.L. (1991). Involvement of the amygdala in the memory-enhancing effects of clenbuterol. Psychopharmacology, 104(4) 541-544.

Kato, N. and McEwen, B. (2003). Neuromechanisms of emotions and memory. Neuroendocrinology. 11,03. 54-58.

Martin, A.J. (2012). Fear of failure in learning. In N.M. Seel (Ed.). Encyclopedia of the Sciences of Learning. New York: Springer.

North, A & Hargreaves, David & McKendrick, Jennifer. (1999). The Influence of In-Store Music on Wine Selections.

Journal of Applied Psychology. 84. 271-276. 10.1037/0021-9010.84.2.271.

Wolf, M.A. (2010). Innovate to Educate: System [Re]Design for Personalized Learning. A Report from the 2010 Symposium. Edited by Partoyan, E., Schneiderman, &Seltz, J. ACSD.p.25. Retrieved from https://siia.net/pli/presentations/PerLearnPaper.pdf

Woolfolk, A. E. (1995). Educational Psychology (6th ed.). Boston: Allyn and Bacon.