

CHAPTER

1 What Is Educational Psychology?

LEARNING OUTCOMES

After studying this chapter, you should be able to:

1. Define psychology;
2. Identify the 4 goals of psychology ;
3. Explain the history of psychology;
4. Describe educational psychology and other subfields in psychology; and
5. Relate the use of educational psychology in teacher decision-making.

INTRODUCTION

Welcome to the wonderful world of **Psychology**



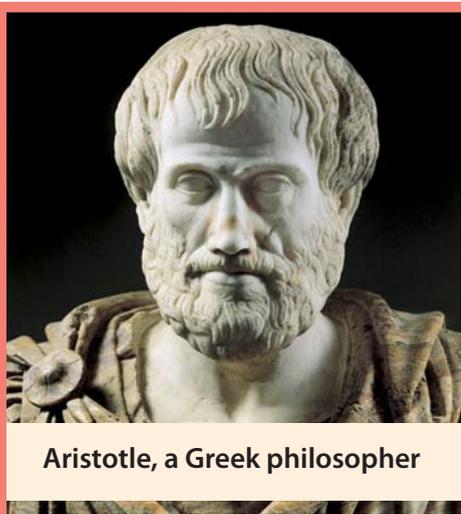
Learning psychology, or educational psychology to be exact, is not only full of fun and surprises, but also valuable to you. This course is important particularly in your journey to understand yourself and your future students.

In this introductory chapter, we begin with the definition of psychology and the goals of psychology. Next, we explore the things psychologists study and how they study them. In addition, we summarize the history of psychology. Finally, we look at the meaning of learning and the issues of teachers' decision making in educational psychology.

1.1

WHAT IS PSYCHOLOGY?

Psychology is a broad field. It covers so many areas. Quite a number of its terms are ambiguous and it is open to different interpretations.



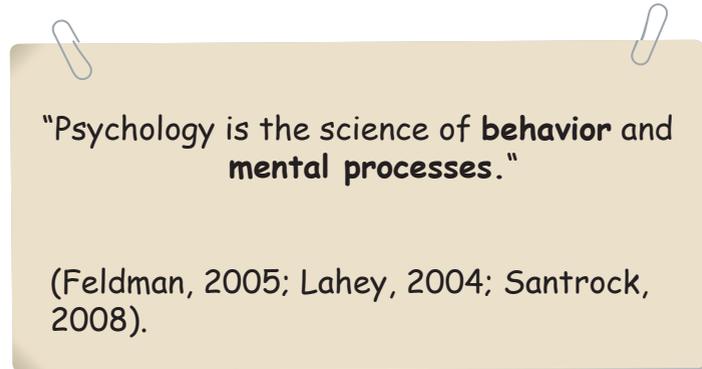
Aristotle, a Greek philosopher

The word psychology comes from Aristotle's word *psyche*, which means **mind** and the word *logos*, which means the **study of**.

psyche + *logos* = psychology

mind + *the study of* = the study of mind

Today, as a modern discipline, psychology is defined as:



The meaning of **behaviour** and **mental processes** according to Feldman, Lahey and Santrock are describes in figure 1.1.

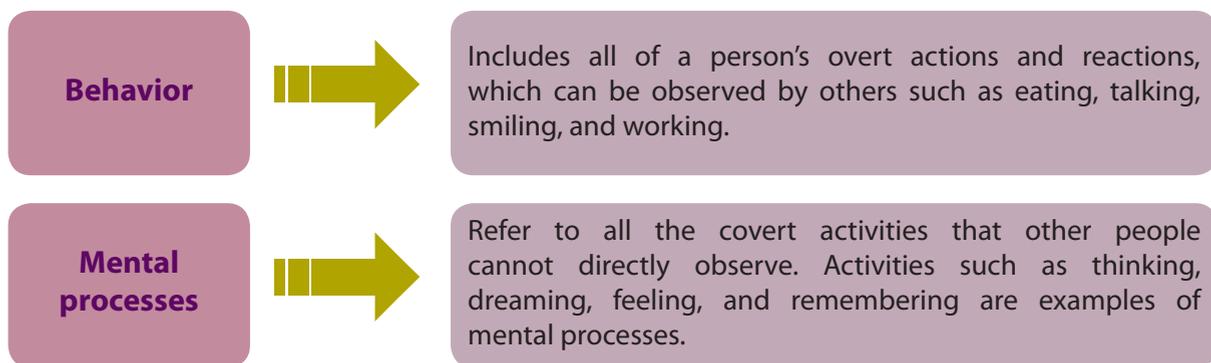


Figure 1.1: Terms of behaviour and mental processes according to Feldman, Lahey and Santrock

As a scientific field, psychologists try to understand both humans' and animals' behaviour through careful and controlled observations. Psychologists use the scientific method to study psychology because they want to avoid faulty observations and conclusions.

1.1.1 Goals of Psychology

There are 4 goals of psychology. The goals of the science of psychology are to describe, understand, predict, and control behaviour and mental processes as illustrated in figure 1.2.

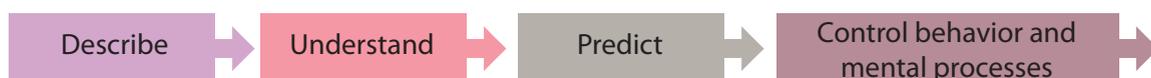


Figure 1.2: Main goals in psychology studies

The descriptions for the goals of the science of psychology are explained in figure 1.3.

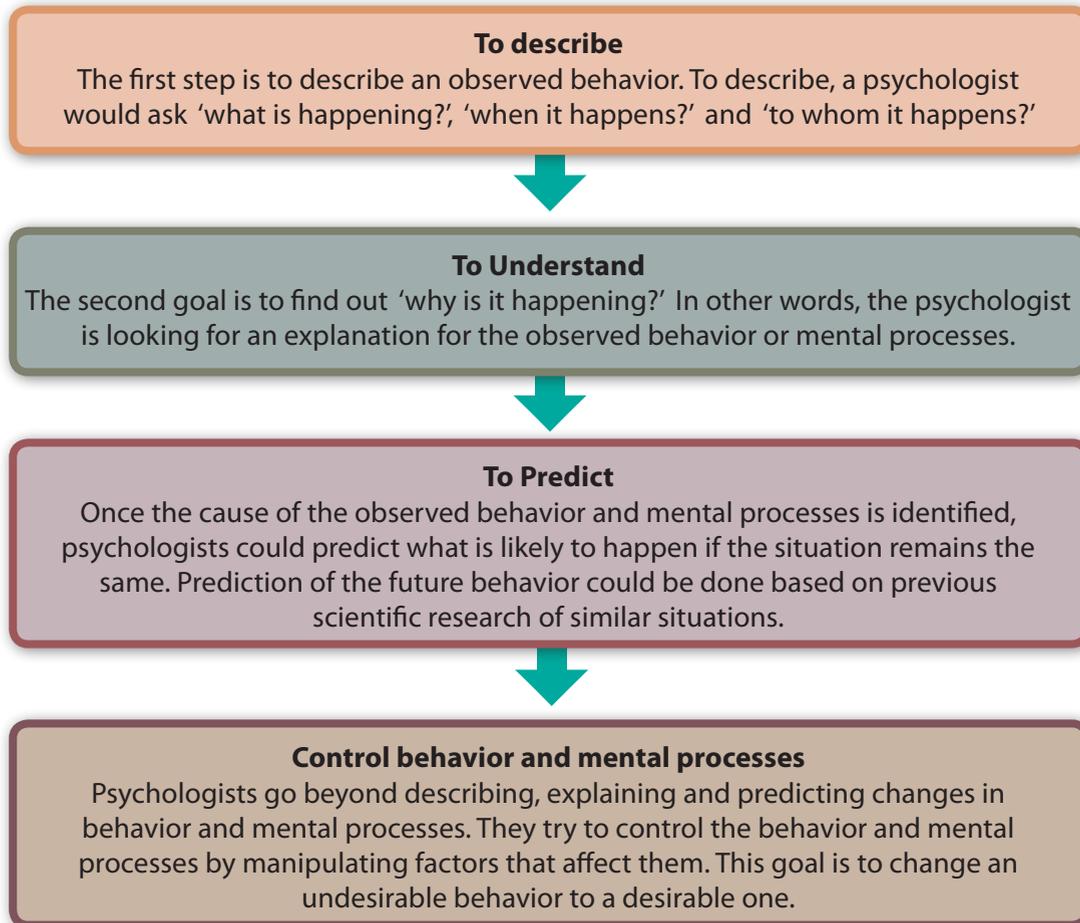


Figure 1.3: Descriptions for 4 goals of the science of psychology

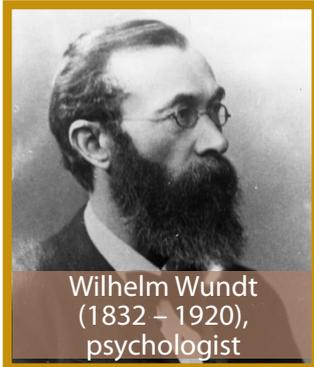
To illustrate all the 4 goals, consider the following example.

A group of psychologists observe a number of students in order to **describe** how large their vocabulary typically is at a certain age. Then, they would **attempt to explain** how students expand the vocabulary and why some students have limited number of vocabulary. Psychologists would **predict** that students with limited number of vocabulary will probably continue to do poorly in academic. Finally, the psychologists would **propose** certain language learning strategies that can be used to **increase** the size of vocabulary of the students.



Why is psychology said to be a very broad science?

1.2 History of Psychology



Psychology’s root can be traced back to the ancient Greek and Romans. However, the formal beginning of psychology as a science is generally set at 1879 when Wilhelm Wundt (1832 – 1920) set up the first psychology laboratory in Leipzig, Germany. It was the experimental laboratory devoted to psychological phenomena. Wundt developed a perspective known as structuralism. Structuralism focused on the basic elements that constitute the foundation of mental states and activities such as perception, consciousness, thinking, and emotion.

Using a method called introspection, Wundt and his student, Edward Titchener (1867 - 1927), examined the elements of consciousness. In introspection procedure, people were asked to describe what they were experiencing when presented with a stimulus such as a fresh star fruit. They were asked to use their own words and describe the star fruit as much detail as they could.

Another early approach to psychology, known as functionalism, concentrated on what the mind does and how behaviours function. This school of thought emerged from the work of William James (1842 - 1910). The functionalists were interested in how mental processes adapt to help people survive in the natural world. John Dewey (1859 - 1952) drew on functionalism to develop the field of school psychology.

Gestalt is a perspective focuses on the belief that human consciousness cannot be broken down into its elements. This approach to psychology was founded on the concept of the gestalt, or whole. Gestalt psychologists led by Max Wertheimer (1880 - 1943) have made substantial contributions to our understanding of perception. Gestaltists pointed out that perception has meaning only when it is seen as a whole.

Figure 1.4 summarise some early approach on psychology study introduced by the psychologist.

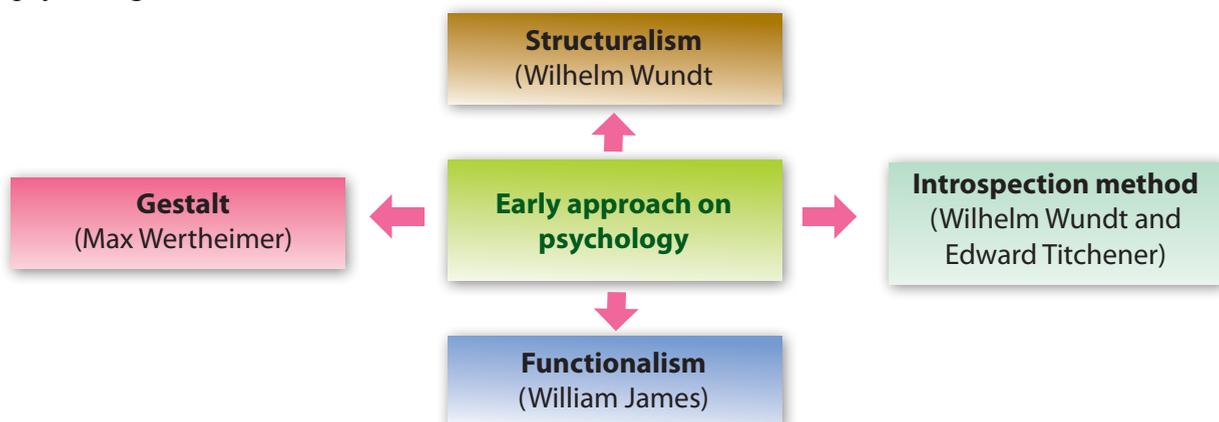


Figure 1.4: Among of an early approach on psychology studies

Today, there are 5 main perspectives of psychology. The perspectives are neuroscience, psychodynamic, behavioural, cognitive and humanistic. The prominent figures and key ideas of the 5 major perspectives of psychology are shown in Table 1.1.

Table 1.1: Key Ideas and Prominent Figures of the 5 Perspectives of Psychology

Perspective	Key idea
Neuroscience	<ul style="list-style-type: none"> Views behavior from the perspective of the brain, the nervous system, and other biological functions. Study how heredity, brain, and nervous system affect behavior. Among major contributions: <ul style="list-style-type: none"> - Developing cures for certain types of deafness - Identifying medications to treat people with severe mental disorders
Psychodynamic	<ul style="list-style-type: none"> Believes that behavior is motivated by unconscious inner forces over which an individual has little control. The contemporary psychodynamic perspective has provided a means to understand and treat some kinds of psychological disorder, prejudice and aggression. Prominent figure: Sigmund Freud (1856 - 1939)
Behavioral	<ul style="list-style-type: none"> Emphasizes the process of learning and the measurement of overt behavior. Focuses on how a specific stimulus (such as an object, a person or an event) lead to a specific responses (that is the behavior in reaction to the stimulus). Among main principles are reinforcement and punishment. Prominent figures: <ul style="list-style-type: none"> - John B. Watson (1878 - 1956) - Ivan Pavlov (1849 - 1936) - Floy Washburn (1871 - 1939)
Cognitive	<ul style="list-style-type: none"> Focuses on how people think, understand, and know about the world. Emphasizes on learning how people comprehend and represent the outside world within themselves and how our ways of thinking about the world influence our behavior. Prominent figures: <ul style="list-style-type: none"> - Jean Piaget (1896 - 1980) - Lev Vygotsky (1896 - 1934)
Cognitive	<ul style="list-style-type: none"> Assumes that people have positive values, free will, and deep inner creativity. Combination of these leads people to choose life-fulfilling paths to personal growth. People have an urge to self-actualize that is to develop to their fullest. Prominent figures: <ul style="list-style-type: none"> - Carl Rogers (1902 - 1987) - Abraham Maslow (1908 – 1970)

SELF-CHECK



Each perspective of psychology focused on a different view of behaviour and mental processes. Which of the perspectives makes the most sense to you? Explain.

1.3 What is Educational Psychology?

Psychology is a broad field that includes many diverse topics of study and various applications of its findings and theories. Before we discuss the content of educational psychology, let us look at other subfields of psychology briefly.

The subfields of psychology can be divided into 2 major areas as shown in Figure 1.5:

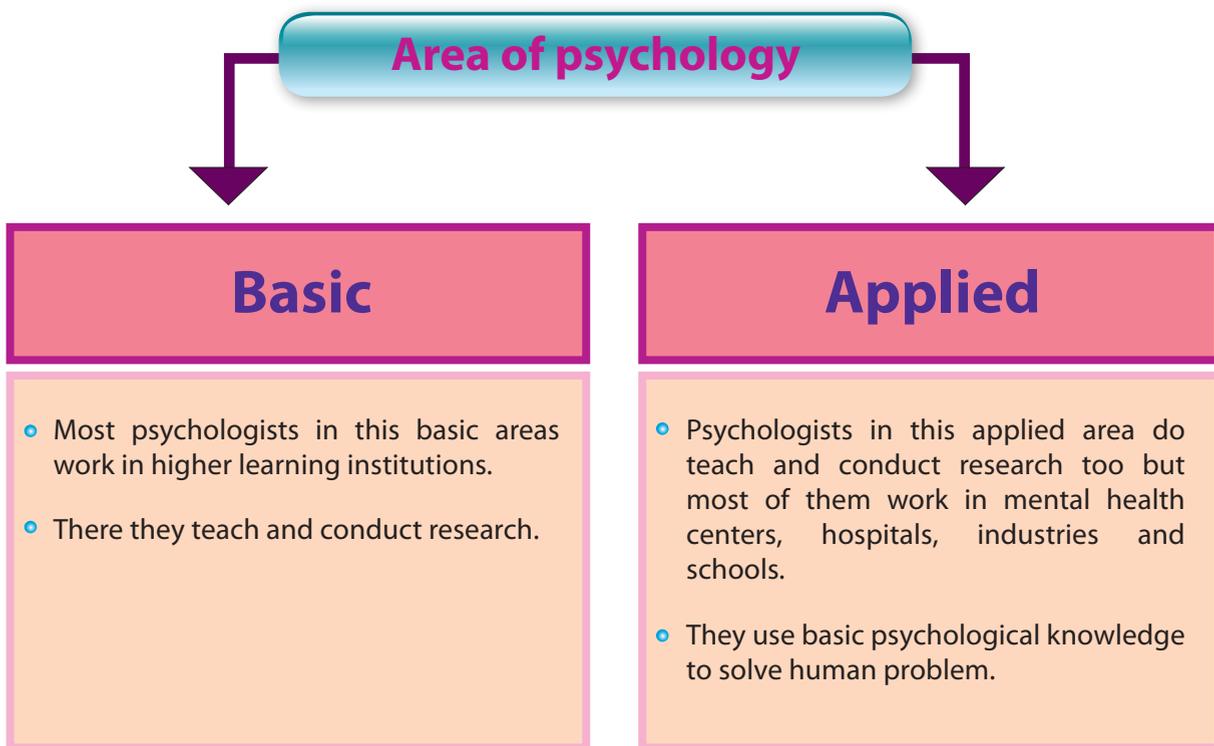


Figure 1.5: 2 major subfields of psychology

There are many interests for each of the major subfield of psychology. The interests of the basic psychology subfield can be described in Table 1.2.

Table 1.2: Interests in the Basic Psychology

The interest of the basic psychology	
Subfield	Description
Biological psychology	<ul style="list-style-type: none"> Examines the biological basis of behavior. Study how nervous system and other organs influence behavior. Study animal behavior and compare it with human behavior.
Sensation and perception	<ul style="list-style-type: none"> Concerned with how the sense organ work and how human perceive incoming sensory information.

Learning and memory	<ul style="list-style-type: none"> • Studies the ways in which we learn and remember new information, skills, habits, and ways of interactions.
Cognitive psychology	<ul style="list-style-type: none"> • Focuses on the study of higher mental processes.
Developmental psychology	<ul style="list-style-type: none"> • Examines how people grow and change from conception to death.
Motivation and emotion	<ul style="list-style-type: none"> • Study the needs and states that activate and guide behavior. • Topics in this subfield include hunger, thirst, sex, the need for achievement, the need to have relationship with others, and the nature of feeling.
Personality	<ul style="list-style-type: none"> • Focuses on the relatively consistent ways of behaving that characterized our personality and the traits that differentiate one person from another.
Social psychology	<ul style="list-style-type: none"> • Studies how people's thoughts, feelings, and actions are affected by others. • Social psychologists are interested in investigating behavior of people in groups, interpersonal attraction, intimate relationship, attitude, and prejudice.
Sociocultural psychology	<ul style="list-style-type: none"> • States that it is necessary to understand one's culture, ethnic identity, and gender identity to fully understand a person.

Table 1.3 shows the interests of the psychology in applied subfield.

Table 1.3: Interests in the Applied Psychology

The interest of the applied psychology	
Subfield	Description
Clinical psychology	<ul style="list-style-type: none"> • Tries to understand and treat emotional problems and correct abnormal behavior.
Counselling	<ul style="list-style-type: none"> • Helps people with personal or school problems and with career choices.
Industrial and Organizational psychology	<ul style="list-style-type: none"> • Concerned with the psychology of the workplace.
Sport psychology	<ul style="list-style-type: none"> • Applies psychology to improve athletic performance, activity, and exercise.

Educational psychology can be defined in various ways. Let's look at the 2 definitions of educational psychology according to Fetsco & McClure and Santrock.

According to Fetsco & McClure:

Educational psychology is a branch of applied psychology, which concerned with the study of behavior and mental processes associated with human learning and instruction.

Fetsco & McClure, 2005.

While, according to Santrock

Educational psychology is a branch of psychology that specializes in understanding teaching and learning in educational setting.

Santrock, 2008

Educational psychologists focus on the critical intersection between the mind and action of the learner, teacher, and educational community. The main issues studied and discussed by educational psychologists can be shown in the figure 1.6.

Main issues studied and discussed by educational psychologists

- Nature of learner and learning.
- Nature of classrooms that affect learning.
- Characteristics of effective teaching.
- Factors that motivate students learning.
- Strategies students use to learn.
- The most effective and supportive ways to interact with students.
- Techniques to manage a child with a special needs.
- Students' physical, cognitive, social, emotional, and moral development assessment and evaluation of learning.

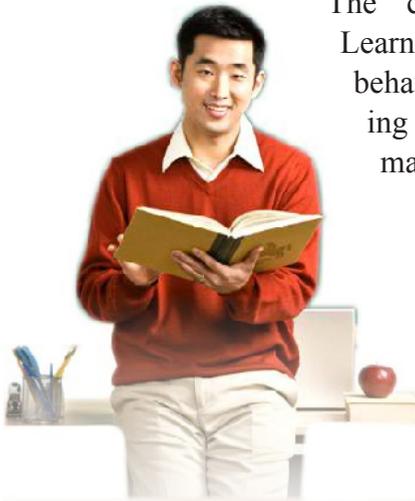
Figure 1.6: List of the main issues studied and discussed by educational psychologist



1. Psychologists can be found working in the
 - a. _____
 - b. _____
 - c. _____
 - d. _____
2. What are the principal issues common to educational psychology?

1.4

WHAT IS LEARNING?



The central focus of educational psychology is **learning**. Learning means change in behaviour. However, not all changes in behaviour are the result of learning. Temporary changes resulting from illness, fatigue, or hunger and changes that caused by maturation do not qualify as learning.

According to Lahey;

"...to qualify as learning, change in behavior must be brought about by the interaction of a person with his or her environment. Thus, learning can be defined as any relatively permanent change in behavior, knowledge, and thinking skills, which comes about through experiences."

(Lahey, 2004).

In psychology, learning can be viewed from 3 major perspectives as shown in Figure 1.7. The perspectives are behavioural, cognitive learning and social cognitive learning.

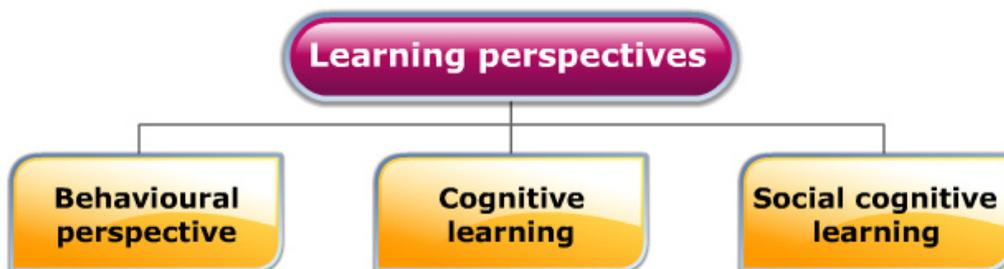
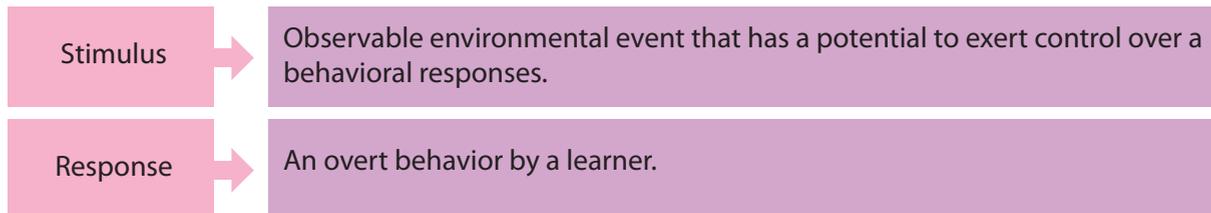


Figure 1.7: 3 major learning perspectives in psychology.

The descriptions for the 3 major perspectives in psychology are explained below.

(a) Behavioural perspective

From the **behavioural perspective**, learning is defined in terms of observable events, called **stimuli** and **responses**.



Consider the following examples of stimulus and response.

Stimulus		Response
Suria desires good grade in class.	→	Suria does every homework given by teacher.
Classmates laugh when Samy gives the wrong answer.	→	Samy stops participating in class.

(b) Cognitive learning perspective

From a **cognitive learning perspective**, learning involves the transformation of information in the environment into knowledge that is stored in the mind.

- Learning occurs when new knowledge is acquired or existing knowledge is modified by experience.
- Cognitive learning theories are used to explain simple task such as remembering the name of a new friend as well as the complex ones such as interpreting an abstract drawing.
- This approach of learning focuses on how children process information through attention, memory, thinking, and other cognitive processes.

(c) Social cognitive learning.

The third main approach to learning is the **social cognitive learning**. This perspective examines the process involved as people learn from observing others and gradually acquires control over their own behaviour. In other words, social cognitivists believe that people learn a new behaviour simply by watching what other people do.

For examples, students are better reader when their parents read often at home and children become more aggressive when they observe aggressivemodels on television. The watching process is popularly known as **modeling**.



For detail explanations regarding to the 3 learning perspective, refer to the related topic:

- Behavioral learning perspective in chapter 4.
- Cognitive learning perspective in chapter 5.
- Social cognitive perspective in chapter 4.



Look at the examples below. Which are instances of learning? Which are not?

- a. A 7-year-old boy sings “Ba Ba Black Sheep”
- b. Smith behaves oddly after he met with an accident.
- c. You feel disgust for fried chicken because you got sick after eating one.
- d. Children become better badminton player as they grow older.
- e. Zurin finds herself playing computer games more and more
- f. Babies crawl at 7 months old.
- g. Students use the computer in as new way.

1.5

MEASUREMENT IN EDUCATIONAL PSYCHOLOGY



Teachers learn a great deal of knowledge from their personal experience in the teaching and learning process. They also learn from the experiences shared by other teachers, administrators, and experts.



Apart from experience, research is also a valuable source of information. Generally, research is a systematic process for collecting information when you are in doubt about a particular issue. Teachers use this method to clarify the problems by looking closely at research on that topic.

In this section, we will look into 2 types of scientific methods used to gather information in educational psychology as shown in Figure 1.8.



Figure 1.8: 2 types of scientific methods used to gather information in educational psychology

1.5.1 Descriptive Studies

The simplest methods of scientific inquiry are the descriptive studies. Descriptive studies are used to describe predictable behaviour and mental processes. The most widely used descriptive methods are survey, observation, and correlational research.

Survey



- Survey is done simply by asking people questions through questionnaires and interviews.
- Educational psychologists may use survey to find out students' and teachers' feeling, belief, experience, problem, needs, and interest.
- Questionnaires can be distributed to the targeted population by hand or by mail while interviews are normally held via face-to-face interactions. Alternatives to these are the interviews over the phone or the internet.

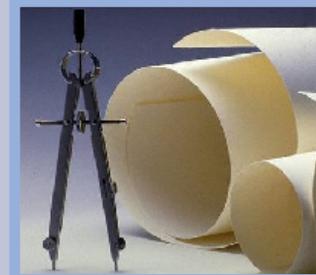
Observation



- Observation is a research method based on watching, recording, and describing behavior as it occurs.
- Educational psychologists conduct naturalistic observations of children in classrooms, on field, in homes, and in other settings interactions.
- Alternatives to these are the interviews over the phone or the Internet.

Correlational research

- In correlational research, the strength of the relation between two or more variables is studied.
- For example, an educational psychologist may ask “does a relationship exist between the number of question teachers ask and their students’ grade or academic performance?”
- Correlations range from +1.00 to - 1.00. The closer it is to either +1.00 or -1.00, the stronger the relationship.
- Lack of a relationship would be indicated by a correlation close to 0.



The positive or negative sign of the correlation shows the direction of the relationship. These relationships are graphically shown in Figure 1.9.

Positive correlation



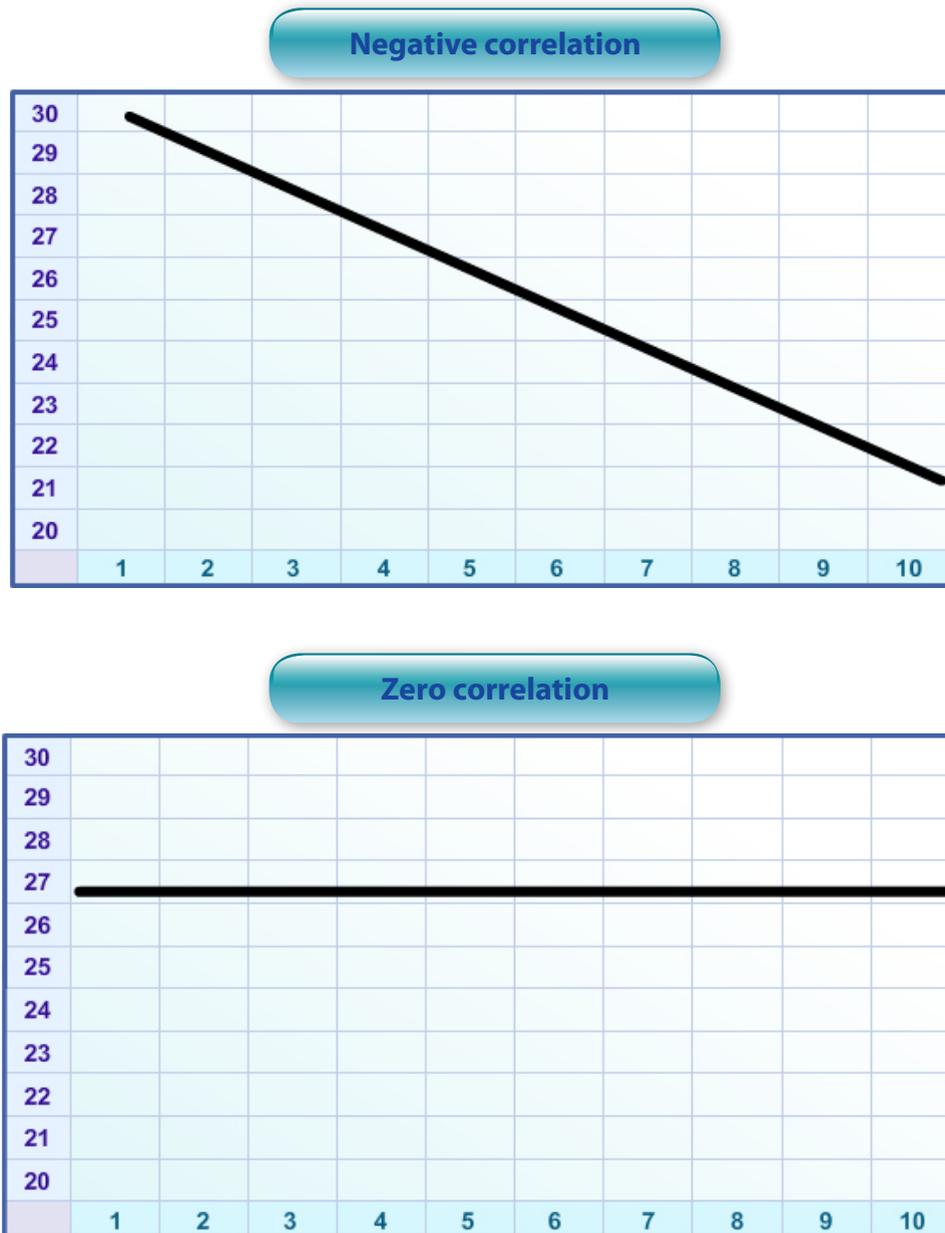


Figure 1.9: Illustration of positive, negative and zero correlation

It is important to note that correlations do not prove cause and effect. The research method that demonstrates cause-and-effect relationship is the experiment.

1.5.2 Experimental Studies

Formal experiments are helpful in achieving the goals of understanding and influencing behaviour and mental processes. In a formal experiment, participant must be assigned to treatment conditions randomly so that participants' characteristics are distributed evenly across the different conditions. The simplest kind of experiment involves several elements as shown in figure 1.10.

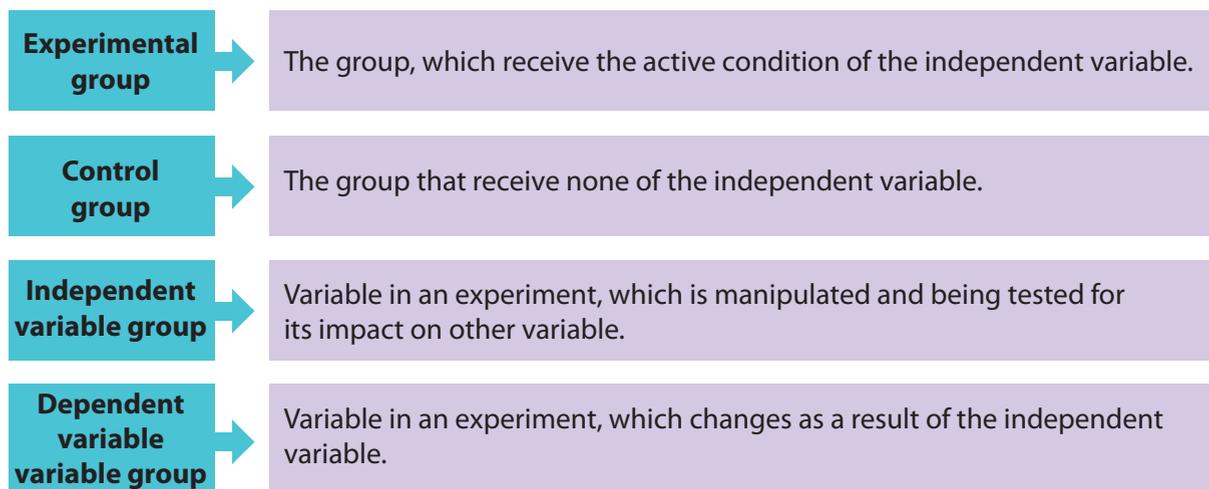


Figure 1.10: 4 Elements involved in experiment

Differences between the groups on the dependent variable can be said to be caused by the independent variable. In a study of cause and effect, independent variable is the cause while dependent variable is the effect. Figure 1.11 shows the steps in conducting a formal experiment.

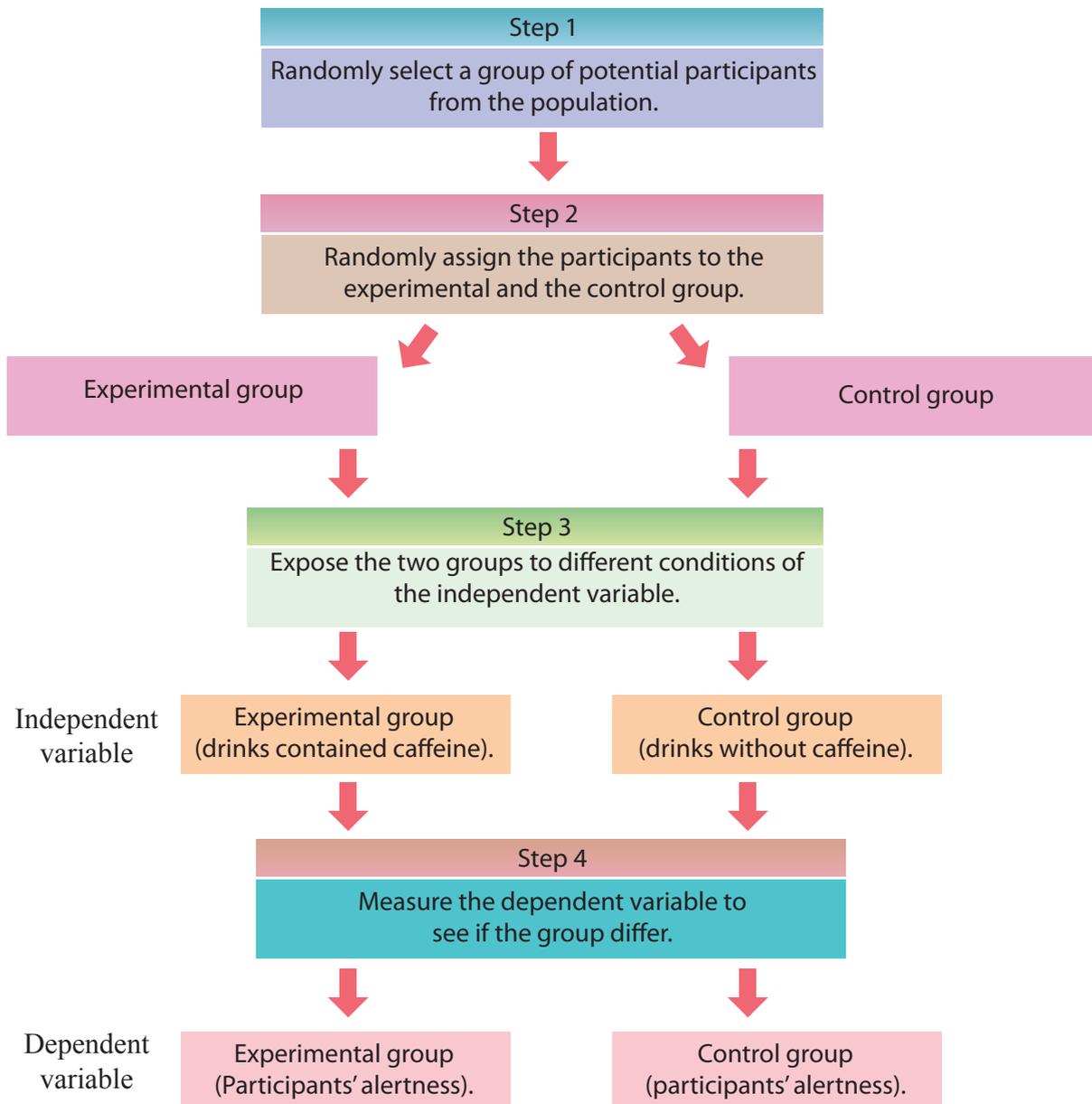


Figure 1.8: Steps in conducting a formal experiment of the effects of caffeine intake on students' alertness



1. A research method which allows psychologists to study behaviour as it occurs in real-life settings is known as _____.
2. What are some of the advantages survey research?
3. Give an example of correlational research?

1.6 TEACHERS' DECISION MAKING AND EDUCATIONAL PSYCHOLOGY

Teachers have various roles. The main role is the content expert. However, this role alone is not sufficient to describe the work of teachers. Teachers are also consultants, managers, motivators, and counsellors. On top of those roles, teachers are also decision makers. Each teacher has to engage in an ongoing series of decision-making. Generally, the types of decisions teachers make can be divided into 3 areas as shown in figure 1.12. The areas are planning decisions, teaching and managing decisions, and assessment decisions as shown in figure 1.12.

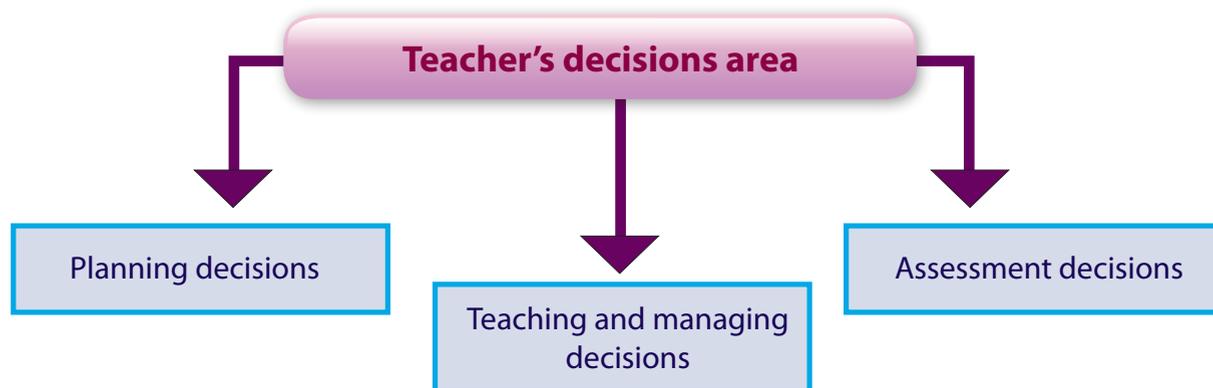


Figure 1.9: 3 types of teacher's decision maker.

The explanation for the 3 types of teacher's decision area can be describe below.

(a) Planning decisions

Planning decisions include decisions that are made before a specific interaction with the learners occurs.

For example:
Teachers must plan the curriculum and learning activities before the school session begins. Teachers must also decide what they want to teach and when they wish to teach it in advanced.

(b) Teaching and managing decisions

Teaching and managing decisions include those decisions made while interacting with the students.

For example:
Teachers must decide how to respond to students' behavior or questions in the classrooms and how they will go about the teaching process.

(c) Assessment decisions

The assessment decisions are decisions made to assess the effectiveness of an interaction with the students. These include the topics to be assessed and the format of the assessment.

Teaching includes a great deal of uncertainty and ambiguity. Therefore, careful and professional judgments and personal decision-making are essential for effective teaching. Unfortunately, teachers may sometimes use common sense in making these decisions. Indeed, it is important for teachers to base their decision-making on knowledge of current theories and research, as these will lead them to make good decisions. Research and theories can help teachers understand the patterns of students learning and effective teaching.



Teachers need to think critically, practically and artistically about the research results.

Teachers' decision making can sometimes be complicated by research results that appear contradictory. Since research does not provide a precise answer, teachers must use their professional judgments and decide. In other words, they need to think critically (teacher analyze own situations and compare them with the setting reported in the research), practically (research must be applied efficiently with minimal disruption to the class or extra work for the teacher) and artistically (apply the research results in creative ways and meaningful lessons) about the research results.

SELF-CHECK



Discuss the importance of research and theories in teachers' decision making.

SUMMARY

- Psychology is defined as the science of behaviour and mental processes.
- The goals of the science of psychology are to describe, understand, predict and control behaviour and mental processes.
- Structuralism, functionalism, and Gestalt psychology are among the earliest perspectives of psychology.
- Modern perspectives of psychology include neuroscience, psychodynamic, behavioural, cognitive, and humanistic.
- Educational psychology is a branch of applied psychology which concerned with the study of behaviour and mental processes associated with human learning and instruction.
- Learning is defined as any relatively permanent change in behavior, knowledge, and thinking skills, which comes about through experiences.
- Learning can be viewed from behavioural, cognitive learning, and social cognitive learning approach.
- The most widely used research methods are survey, observation, correlational research and formal experiment.
- Research and theories can help teachers understand the patterns of students learning and effective teaching.

KEY TERMS AND CONCEPTS

Terms	Definitions
Behaviour	A person's overt actions and reactions which can be observed and measured directly.
Behavioural	An approach that emphasizes on the process of learning and the measurement of overt behaviors.
Cognitive	An approach that focuses on how people think, understand, and know about the world.
Cognitive learning	A perspective that views learning as the transformation of information in the environment into knowledge that is stored in the mind.

Control group	The group which receives none of the conditions of the independent variable.
Correlational research	Research method in which the strength of the relation between two or more variables is studied.
Dependent variable	The variable in an experiment which changes as a result of the independent variable.
Educational psychology	A branch of applied psychology which concerned with the study of behavior and mental processes associated with human learning and instruction.
Experimental group	The group which receives the active condition of the independent variable.
Formal experiment	A research method that allows the researcher to manipulate the independent variable in order to study its effect on the dependent variable. It is helpful in achieving the goals of understanding and influencing behavior and mental processes.
Functionalism	An approach that concentrated on what the mind does and how behaviors function.
Gestalt psychology	A perspective that focuses on the belief that human consciousness cannot be broken down into its elements.
Humanistic	A perspective that views people as having an innate tendency to improve and determine their lives by the decisions they make.
Independent variable	The variable in an experiment which is manipulated and being tested for its impact on other variables.
Learning	A relatively permanent change in behavior brought about through experience.
Mental processes	Covert activities such as thoughts, feelings and motives that cannot be observed directly by others.

Neuroscience	An approach that views behavior from the perspective of the brain, the nervous system, and other biological functions.
Observation	A research method based on watching, recording, and describing behavior as it occurs.
Psychology	The scientific study of behavior and mental processes.
Psychodynamic	An approach that believes that behavior is motivated by unconscious inner forces over which an individual has little control.
Response	An overt behavior by a learner.
Social cognitive	A perspective that suggests that people learn a new behavior simply by watching what other people do.
Stimulus	An observable environmental event that has a potential to exert control over a behavioral responses.
Structuralism	An approach that focused on the basic elements that constitute the foundation of mental states and activities such as perception, consciousness, thinking, and emotion.
Survey	A kind of research method in which data is collected through questionnaires and interviews.

ENDNOTES

1. Eggen, P & Kauchak, D. 2007. *Educational psychology windows on classrooms*. 7th ed. New Jersey: Prentice Hall.
2. Feldman, R. S. 2005. *Understanding psychology*. 7th ed. Boston: McGraw Hill.
3. Jordan, E. A. & Porath, M. J. 2006. *Educational psychology a problem-based approach*. Boston: Pearson.
4. Hinrichs, B. H. 2004. *Psychology: the essence of a science*. Boston: Pearson.

5. Kosslyn, S. M. & Rosenberg, R. S. 2004. *Psychology the brain, the person, the world*. 2nd ed. Boston: Allyn and Bacon.
6. Lahey, B. B. 2004. *Psychology: an introduction*. 8th ed. Boston: McGraw Hill.
7. Morris, C. G. & Maisto, A. 2001. *Understanding psychology*. 5th ed. New Jersey: Prentice Hall.
8. Ormrod, J. E. 2006. *Educational psychology developing learners*. 5th ed. New Jersey: Prentice Hall.
9. Santrock, J. W. 2008. *Educational psychology*. 3rd ed. Boston: McGraw-Hill.
10. Tan O. S., Parsons, R. D., Hinson, S. L. & Sardo-Brown, D. 2003. *Educational psychology a practitioner-researcher approach*. Australia: Thomson.
11. Woolfolk, A. 2007. *Educational psychology*. 10th ed. Boston: Pearson.

REVIEW AND DISCUSSION QUESTIONS

1. The ancient Greek philosopher who wrote about psyche was _____.
 - A. Plato
 - B. Aristotle
 - C. Hippocrates
 - D. Epicurus
2. When she took an introductory psychology course, Jamilah learned that psychology is the study of _____.
 - A. conscious experience
 - B. unconscious experience
 - C. human behavior
 - D. behavior and mental processes
3. Which of the following is more scientific?
 - A. Systematic observation
 - B. Personal experience
 - C. A person's opinion
 - D. A book written by a journalist

4. The early American psychologist who founded the school of functionalism was _____ .
 - A. Sigmund Freud
 - B. William James
 - C. Alfred Binet
 - D. Wilhelm Wundt

5. The physician who founded psychoanalysis and studied the unconscious mind and abnormal behavior was _____ .
 - A. Sigmund Freud
 - B. William James
 - C. Alfred Binet
 - D. Max Wertheimer

6. “It is behavior that can be observed that should be studied, not the suspected inner workings of the mind.”

This statement was most likely made by someone with _____ perspective.

 - A. cognitive
 - B. neuroscience
 - C. humanistic
 - D. behavioral

7. Self-actualization is a key idea in the school of psychology known as _____.
 - A. functionalism
 - B. humanism
 - C. behaviorism
 - D. psychodynamic

8. Which of these topics would be most interesting to a behaviorist?
 - A. Memory strategies
 - B. Interpretation of dreams
 - C. Thinking process of preschool children
 - D. Situation that make people talk faster

10. The basic area of psychology that studies intimate relationship and prejudice is _____.
- A. neuroscience
 - B. health psychology
 - C. counseling
 - D. social psychology
11. Which of the following represents an applied area of modern psychology?
- A. Developmental psychology
 - B. Educational and psychology
 - C. Cognitive psychology
 - D. Social psychology
12. Which of the following is the best thought of as a state?
- A. Intelligence
 - B. Personality
 - C. Friendship
 - D. Emotion
13. The things that are measured and studied in psychology are called _____.
- A. factors
 - B. variables
 - C. constructs
 - D. behavior and mental processes
14. Which of the following techniques is used in descriptive research?
- A. Random assignment of participants
 - B. Manipulation of a variable
 - C. Observation in a natural setting
 - D. Defining the dependent variable
15. A research method that uses interviews and questionnaires is known as the _____.
- A. descriptive method
 - B. replication method
 - C. survey method
 - D. correlational method

16. A correlation coefficient of zero has been found in determining the relationship between two variables. What is the relationship between these two variables?
 - A. No relationship
 - B. Strong relationship
 - C. Positive relationship
 - D. Negative relationship

17. A high negative correlation between anxiety and intelligence means that anxious students usually have _____.
 - A. lower intelligence
 - B. higher intelligence
 - C. medium intelligence
 - D. It is impossible to say from this information.\

18. A hypothesis in the form “X causes Y” is appropriate for a _____.
 - A. correlational study
 - B. survey
 - C. controlled experiment
 - D. double blind research

19. An educational psychologist exposed participants to four types of films. Then, he measured the degree of aggressiveness showed by the participants. In this study, aggressiveness is the _____ variable.
 - A. experimental
 - B. control
 - C. dependent
 - D. independent

20. The scientific method that allows the researcher to reach the strongest conclusion about cause-and-effect is _____.
 - A. naturalistic observation
 - B. clinical intervention
 - C. correlational study
 - D. formal experiment