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LOGIC AND CRITICAL THINKING

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Table of Contents

COURSE INTRODUCTION 8
COURSE OBJECTIVES 10
CHAPTER ONE 11
LOGIC AND PHILOSOPHY 11
Chapter Overview 11
Lesson 1: Meaning and Nature of Philosophy 11
Lesson 2: Basic Features of Philosophy 15
Core Fields of Philosophy 19
Lesson 3: Metaphysics and Epistemology 19
3.1 Metaphysics 20
3.2 Epistemology 22
Lesson 4: Axiology and Logic 26
4.1 Axiology 27
4.2 Logic 30
Lesson 5: Importance of Learning Philosophy 31
Chapter Summary 33
Self Check Exercise 35
References 36
CHAPTER TWO 37
BASIC CONCEPTS OF LOGIC 37
Chapter Overview 37
Lesson 1: Basic Concepts of Logic: Arguments, Premises and Conclusions 39
Lesson 2: Techniques of Recognizing Arguments 48
2.1 Recognizing Argumentative Passages 49
2.2 Recognizing Non-argumentative Passages 52

Lesson 3: Types of Arguments: Deduction and Induction 63
3.1 Deductive Arguments 64
3.2 Inductive Arguments 65
3.3 Differentiating Deductive and Inductive Arguments 66
Lesson 4: Evaluating Arguments 73
4.1 Evaluating Deductive Arguments: Validity, Truth, and Soundness 74
4.2 Evaluating Inductive Arguments: Strength, Truth, and Cogency 79
Chapter Summary 82
Self Check Exercise 85
References 86
CHAPTER THREE 87
LOGIC AND LANGUAGE 87
Chapter Overview 87
Lesson 1: Philosophy of Language: An overview 88
1.1 What is Philosophy of Language? 88
1.2 A Brief Note on the Debates and History of Philosophy of Language 89
1.3 Some Philosophical Approaches to the Nature of Meaning 90
Lesson 2: Logic and Meaning 92
2.1 The Functions of Language: Cognitive and Emotive Meanings 92
2.2 The Intension and Extension of Terms 99
Logic and Definition 103
Lesson 3: Meaning, Types, and Purposes of Definitions 103
3.1 The Meaning of Definition 104
3.2 The Types and Purposes of Definitions 104
Lesson 4: Techniques of Definition 109
4.1 The Extensional (Denotative) Definitional Techniques 110
4.2 The Intensional (Connotative) Definitional Techniques 113

Lesson 5: Criteria for Lexical Definitions 116
Chapter Summary 122
Self Check Exercise 124
References 125
CHAPTER FOUR 126
BASIC CONCEPTS OF CRITICAL THINKING 126
Lesson 1: Meaning of Critical Thinking 127
Lesson 2: Standards of Critical Thinking 131
Lesson 3: Codes of Intellectual Conduct for Effective Discussion 136
3.1 Principles of Good Argument 137
3.2 Principles of Critical Thinking 142
Lesson 4: Characteristics of Critical Thinking 147
4.1 Basic Traits of Critical Thinkers 147
4.2 Basic Traits of Uncritical Thinkers 148
Lesson 5: Barriers to Critical Thinking 150
Lesson 6: Benefits of Critical Thinking 157
Chapter Summary 161
Self Check Exercise 162
References 162
CHAPTER FIVE 163
LOGICAL REASONING AND FALLACIES 163
Chapter Overview 163
Lesson 1: Fallacy in General 164
1.1 The Meaning of Fallacy 165
1.2 Types of Fallacies 166
Informal fallacies 168
Lesson 2: Fallacies of Relevance 169

Lesson 3: Fallacies of Weak Induction 187
Lesson 4: Fallacies of Presumption 201
Lesson 5: Fallacies of Ambiguity and Grammatical Analogy 209
5.1 Fallacies of Ambiguity 210
5.2 Fallacies of Grammatical Analogy 213
Chapter Summary 217
References 218
CHAPTER SIX 219
CATEGORICAL PROPOSITIONS 219
Chapter Overview: 219
Lesson 1: General Introduction 219
1.1 Standard-Forms of Categorical Proposition 221
1.2 The Components of Categorical Propositions 223
Lesson 2: Attributes of Categorical Propositions: Quality, Quantity, and Distribution 225
Lesson 3: Venn Diagrams and the Modern Square of Opposition 229
3.1 Representing Categorical Propositions in Diagrams 229
3.2 Squares of Opposition: Traditional and Modern Squares of Opposition 231
3.3 The Traditional Square of Opposition 232
Lesson 4: Evaluating Immediate Inferences: Using Venn Diagrams and Square of Oppositions 235
4.1 Logical Operations: Conversion, Obversion, and Contraposition 240
Chapter Summary 250
Self-Check Exercises 250
References 252

COURSE INTRODUCTION

Dear learners,

The course, *Logic and Critical Thinking,* is a high-level thought course in the discipline of philosophy. It is a philosophical inquiry that takes argumentation and reasoning as its basic objects of investigation and attempts to introduce the fundamental concepts of logic and methods of logical argumentation and reasoning and critical thinking. It includes evaluation of the methods by which we form beliefs, weigh evidence, assess hypotheses and arguments, and analyze reasoning. Logic is concerned with the study of arguments, and it seeks to establish the conditions under which an argument may be considered as acceptable or good. It includes the development of standard methods and principles of arguments. Critical thinking is an exercise, a habit, a manner of perception and reasoning that has principles of logic as its fulcrum, and dynamically involves various reasoning skills that ought to be human approach to issues and events of life. Critical thinking means correct thinking in the pursuit of relevant and reliable knowledge about the world. In another way, critical thinking is the reasonable, reflective, responsible, and skillful thinking that focuses on deciding what to believe or do. To think critically is to examine ideas, evaluate them against what you already know and make decisions about their merit. A person who thinks critically can ask appropriate questions, gather relevant information, efficiently and creatively sort through this information, reason logically from this information, and come to reliable and trustworthy conclusions about the world that enable one to live and act successfully in it. When you think critically, you weigh up all sides of an argument and evaluate its validity, strengths and weaknesses. Thus, critical thinking skills entail actively seeking all sides of an argument: evaluating the soundness of the claims asserted and the evidence used to support the claims.

Therefore, this course is designed to help students to develop not only the ability to construct reliable and logically defendable arguments of their own and rationally evaluate the arguments of others, but also the abilities and skills of critical thinking. All education consists of transmitting two different things to students: (1) the subject matter or discipline content of the course ("what to think"), and (2) the correct way to understand and evaluate this subject matter ("how to think"). We may do an excellent job of transmitting the content of our respective academic disciplines, but we often fail to teach students how to think effectively about this subject matter, that is, how to

properly understand and evaluate it. That means, we often fail to teach how to think critically. Hence, the primary aim of this course is to teach students essential skills of analyzing, evaluating, and constructing arguments, and to sharpen their ability to execute the skills in thinking and writing, and thus better prepare them to succeed in the world. The understanding of the methods by which we develop our own arguments, form beliefs, weigh evidence, assess hypotheses and arguments, and analyze reasoning will help you rationally evaluate the credibility of claims and arguments you encounter in media, in everyday conversation, and in the classroom. You will also learn to become aware of errors in reasoning and judgment, which we all occasionally commit. Finally, you will learn to develop your own arguments with clarity and precision.

Dear learners, this module consists of six important chapters or modules[1]. The first chapter deals with the basic concepts of philosophy, the meaning and definition of philosophy, the core branches of philosophy, and the importance of learning philosophy. The second chapter of this module is devoted to the basic concepts of logic: the definition and components of arguments, the techniques of recognizing arguments, types of arguments, and evaluation of arguments. The third chapter deals with the relationship between logic and language. It discusses the cognitive and emotive meaning of words, the intensional and extensional meaning of terms, the types and purposes of definitions, and the intensional and extensional definitional techniques, from a philosophical point of view. The basic concepts of critical thinking, (i.e., the meaning and definition of critical thinking, the principles of critical thinking, the factors that affect critical thinking, and the standards of good arguments), is addressed in the fourth chapter. The fifth chapter discusses the various forms of logical errors in arguments, which are commonly known as 'fallacies', with a special emphasis on the categories of informal fallacies. The components, attributes and representations of categorical propositions are discussed in the last chapter of the module.

[1] In this teaching material, the terms "Chapter" and "Module" are equivalent and used interchangeably.

COURSE OBJECTIVES

After the successful accomplishment of the course, students will able to:

- Understand the basic essence and areas of philosophy, and the necessity of learning it;
- Recognize the components and types of arguments;
- Develop the skill to construct and evaluate arguments;
- Understand the relationship between logic and language;
- Recognize the forms of meanings of words and terms;
- Comprehend the types, purposes and techniques of definitions;
- Understand the concept, principles, and criteria of critical thinking;
- Cultivate the habits of critical thinking and develop sensitivity to clear and accurate usage of language;
- Recognize the various forms of formal and informal fallacies; and
- Understand the components, attributes and representations of categorical propositions.

CHAPTER ONE

LOGIC AND PHILOSOPHY

Chapter Overview

Logic is often treated simultaneously as a field of study and as an instrument. As a field of study, it is a branch of philosophy that deals with the study of arguments and the principles and methods of right reasoning. As an instrument, it is something, which we can use to formulate our own rational arguments and critically evaluate the soundness of others' arguments. Before logic itself has become a field of study, philosophers have been using it as a basic tool to investigate issues that won their philosophical attention, such as, reality, knowledge, value, etc. Philosophy is the study of general and fundamental problems concerning matters such as existence, knowledge, truth, beauty, law, justice, validity, mind, and language. It is a rational and critical enterprise that tries to answer fundamental questions through an intensive application of reason- an application that draws on analysis, comparison, and evaluation. It involves reason, rational criticism, examination, and analysis. In this chapter, we will learn the fundamental nature, concepts, features and areas of philosophy. Furthermore, we will discuss why it is so important to learn philosophy.

Chapter Objectives:

Dear learners, after the successful completion of this chapter, you will be able to:

- Understand the meaning, nature and features of philosophy;
- Recognize the major fields of philosophy; and
- Understand why it is so important to learn logic and philosophy.

Lesson 1: Meaning and Nature of Philosophy

Lesson Overview

Because of its universal nature, it is difficult to define philosophy in terms of a specific subject matter. However, we can define it etymologically as 'love of wisdom'. Thus, as a pursuit of wisdom, philosophy refers to the development of critical habits, the continuous search for truth,

and the questioning of the apparent. In this lesson, students will be introduced with the fundamental meaning, nature, and concepts of philosophy.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Recognize the basic concepts of philosophy.
- Understand the meaning and nature of philosophy.

Activity # 1: - *Dear learners, do you have a prior awareness of philosophy? If so, how do you understand philosophy?*

Dear learners, it is important to note first that giving a clear-cut definition of philosophy is difficult. It may be easy to define other disciplines, such as, chemistry, physics, geography, etc in terms of a subject matter, for they have their own specific subject matters to primarily deal with. However, it is difficult to do the same with philosophy, because philosophy has no a specific subject matter to primarily deal with. Philosophy deals primarily with issues. What contents philosophy has are not the specific subject matters, but issues, which are universal in nature. However, this should not lead us into thinking that philosophy is incomprehensible. It is only to say that whenever you want to understand philosophy, it is better to read different thoughts of philosophers, consciously see its salient features by yourself, participate in it, and do it.

Philosophy is not as elusive as it is often thought to be. Nor is it remote from our various problems. It is unanimously agreed that the best way to learn and understand philosophy is to *philosophize*; i.e., to be confronted with philosophical questions, to use philosophical language, to become acquainted with differing philosophical positions and maneuvers, to read the philosophers themselves, and to grapple with the issues for oneself. Socrates once stated that ***"Wonder is the feeling of a philosopher, and philosophy begins in wonder"***. It is true that most of us may not have a clear knowledge about the history, nature, language, and issues of philosophy. But, we all think and reflect in our own way about issues that matter us most. We all have touched and moved by the feelings of wonder from which all philosophy derives. Thus, we all participate, more or less, in philosophical issues, even though thinking alone cannot make us philosophers.

If, however, you still want to find its clear-cut definition, it is better to refer to the etymology of the word itself, instead of trying to associate it with a certain specific subject matter. Etymologically, the word "*philosophy*" comes from two Greek words: "*philo*" and "*sophia*", which mean "*love*" and "*wisdom*", respectively. Thus, the literal definition of philosophy is ***"love of wisdom".*** The ancient Greek thinker Pythagoras was the first to use the word "*philosopher*" to call a person who clearly shows a marked curiosity in the things he experiences. Anyone who raises questions, such as Does God exists? What is reality? What is the ultimate source of Being? What is knowledge? What does it mean to know? How do we come to know? What is value?, and the like, is really showing a curiosity that can be described as a vital concern for becoming wise about the phenomena of the world and the human experiences. Therefore, seeking wisdom is among the various essences of philosophy that it has got from its etymological definition. Nevertheless, this is not sufficient by itself to understand philosophy, for not all wisdoms are philosophy.

Activity # 2: - *Dear learners, what do you think is the wisdom that philosophers seek?*

The wisdom that philosophers seek is not the wisdom of the expertise or technical skills of professionals. Someone may be encyclopedic, and thus seemingly intelligent, but he may actually be foolish when it comes to understanding the meaning and significance of what he knows. According to Socrates, wisdom consists of a critical habit and eternal vigilance about all things and a reverence for truth, whatever its form, and wherever its place. Based on the Socratic understanding of wisdom, philosophy, as a pursuit of wisdom, is, thus, the development of critical habits, the continuous search for truth, and the questioning of the apparent.

Activity # 3: - *Dear learners, what do you think does it mean to question the apparent? Does it mean to deny the fact or the practical reality?*

To interrogate the obvious means to deal creatively with the phenomenal world, to go beyond the common understanding, and to speculate about things that other people accept with no doubt. But, questioning/criticism is not the final end of philosophy, though raising the right question is often taken not only as the beginning and direction of philosophy but also as its essence. Raising the

right question is an art that includes the ability to foresee what is not readily obvious and to imagine different possibilities and alternatives of approaching the apparent. When we ultimately wonder about the existing world, and thus raise different questions about its order, each question moves us from the phenomenal facts to a profound speculation. The philosophical enterprise, as Vincent Barry stated, is ***"an active imaginative process of formulating proper questions and resolving them by rigorous, persistent analysis".***

Therefore, philosophy is a rational and critical enterprise that tries to formulate and answer fundamental questions through an intensive application of reason- an application that draws on analysis, comparison, and evaluation. It involves reason, rational criticism, examination, and analysis. Accordingly, we can say that Philosophy has a ***constructive side***, for it attempts to formulate rationally defensible answers to certain fundamental questions concerning the nature of reality, the nature of value, and the nature of knowledge and truth. At the same time, its ***critical side*** is manifested when it deals with giving a rational critic, analysis, clarification, and evaluation of answers given to basic metaphysical, epistemological, and axiological questions.

The other thing, which is worthy of noting, is that ***philosophy is an activity***. It is not something that can be easily mastered or learned in schools. A philosopher is a great philosopher, not because he mastered philosophy, but because he did it. It is not his theory, but his extraordinary ability to critically think, to conceptualize, to analyze, to compare, to evaluate, and to understand- i.e., to *philosophize*- that makes him so. Of course, the product of philosophizing is philosophy as a product. However, what makes someone a great philosopher is not the produced philosophy, but his/her outstanding ability to philosophize.

Lesson 2: Basic Features of Philosophy

Lesson Overview

As an academic discipline, philosophy has its own salient features that distinguishes it from other academic disciplines, be it natural, social and humanistic disciplines. In this lesson, students will be introduced with the generally fundamental features of philosophy.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Recognize and understand the fundamental features of philosophy that makes it a unique academic discipline.

Activity # 1: - *Dear learners, list the possible features of philosophy you could think of based on our previous lesson (Lesson 1) and discuss about them with the student(s) beside you.*

Dear learners, the general features of philosophy can be summarized as follows:

1) *Philosophy is a set of views or beliefs about life and the universe, which are often held uncritically.*

We refer to this meaning as the informal sense of philosophy or "having" a philosophy. Usually when a person says "my philosophy is," he or she is referring to an informal personal attitude to whatever topic is being discussed.

2) *Philosophy is a process of reflecting on and criticizing our most deeply held conceptions and beliefs.*

This is the formal sense of "doing" philosophy. These two senses of philosophy-"having" and "doing"- cannot be treated entirely independent of each other, if we did not *have* a philosophy in the formal, personal sense, then we could not *do* a philosophy in the critical, reflective sense. However, having a philosophy is not sufficient for doing philosophy. A genuine philosophical

attitude is searching and critical; it is open-minded and tolerant- willing to look at all sides of an issue without prejudice. To philosophize is not merely to read and know philosophy; there are skills of argumentation to be mastered, techniques of analysis to be employed, and a body of material to be appropriated such that we become able to think philosophically.

To philosophize also means to generalize. Philosophers are reflective and critical. They take a second look at the material presented by common sense. They attempt to think through a variety of life's problems and to face all the facts involved impartially. The accumulation of knowledge does not by itself lead to understanding, because it does not necessarily teach the mind to make a *critical evaluation* of facts that entail consistent and coherent judgment. Critical evaluations often differ. Philosophers, theologians, scientists, and others disagree, first because they view things from different points of view and with different assumptions. Their personal experiences, cultural backgrounds, and training may vary widely. This is especially true of people living at different times and in different places. A second reason philosophers disagree is that they live in a changing universe. People change, society changes, and nature changes. Some people are responsive and sensitive to change; others cling to tradition and the status quo, to systems that were formulated some time ago and that were declared to be authoritative and final. A third reason philosophers disagree is that they deal with an area of human experience in which the evidence is not complete. Different people may interpret the evidence we do have in various ways. Despite these disagreements, however, philosophers continue to probe, examine, and evaluate the material with the hope of presenting consistent principles by which we can live.

3) *Philosophy is a rational attempt to look at the world as a whole.*

Philosophy seeks to combine the conclusions of the various sciences and human experience into some kind of consistent worldview. Philosophers wish to see life, not with the specialized slant of the scientist or the businessperson or the artist, but with the overall view of someone cognizant of life as a totality. Although there are difficulties and dangers in setting forth any worldview, there also are dangers in confining attention to fragments of human experience. Philosophy's task is to give a view of the whole, a life and a worldview, and to integrate the knowledge of the sciences with that of other disciplines to achieve a consistent whole. Philosophy, according to this view,

attempts to bring the results of human inquiry- religious, historical, and scientific into some meaningful interpretation that provides knowledge and insight for our lives.

4) *Philosophy is the logical analysis of language and the clarification of the meaning of words and concepts.*

Certainly, this is one function of philosophy. In fact, nearly all philosophers have used methods of analysis and have sought to clarify the meaning of terms and the use of language. Some philosophers see this as the main task of philosophy, and a few claim this is the only legitimate function of philosophy. Such persons consider philosophy a specialized field serving the sciences and aiding in the clarification of language rather than a broad field reflecting on all of life's experiences. This outlook has gained considerable support during the twentieth century. It would limit what we call *knowledge* to statements about *observable facts* and their interrelations i.e., to the business of the various sciences. Not all linguistic analysts, however, define *knowledge* so narrowly. Although they do reject and try to "clean up" many non-scientific assertions, many of them think that we can have knowledge of ethical principles and the like, although this knowledge is also experientially derived. Those who take the narrower view neglect, when they do not deny, all generalized worldviews and life views, as well as traditional moral philosophy and theology. From this narrower point of view, the aim of philosophy is to expose confusion and nonsense and to clarify the meaning and use of terms in science and everyday affairs.

5) *Philosophy is a group of perennial problems that interest people and for which philosophers always have sought answers.*

Philosophy presses its inquiry into the deepest problems of human existence. Some of the philosophical questions raised in the past have been answered in a manner satisfactory to the majority of philosophers. Many questions, however, have been answered only tentatively, and many problems remain unsolved. What are philosophical questions? The question "Did Ram make a false statement on his income tax return?" is merely a question of fact. However, the questions "What is truth?" and "What is the distinction between right and wrong?" have philosophical importance. Sometimes we think seriously about fundamental life issues: What is life and why am I here? Why is there anything at all? What is the place of life in this great universe? Is the universe

friendly or unfriendly? Do things operate by chance or through sheer mechanism, or is there some plan, purpose, or intelligence at the heart of things? Is my life controlled by outside forces, or do I have a determining or even a partial degree of control? Why do people struggle and strive for their rights, for justice, for better things in the future? What do concepts like "right" and "justice" means, and what are the marks of a good society? Often men and women have been asked to sacrifice their lives, if need be, for certain values and ideals. What are the genuine values of life and how can it attained? Is there really a fundamental distinction between right and wrong, or is it just a matter of one's own opinions? What is beauty? Should religion count in a person's life? Is it intellectually valid to believe in God? Is there a possibility of a "life after death?" Is there any way we can get an answer to these and many related questions? Where does knowledge come from, and can we have any assurances that anything is true?

The above questions are all philosophical. The attempt to seek answers or solutions to them has given rise to theories and systems of thought, such as idealism, realism, pragmatism, analytic philosophy, existentialism, phenomenology, and process philosophy. Philosophy also means the various theories or systems of thought developed by the great philosophers, such as Socrates, Plato, Aristotle, Augustine, Aquinas, Descartes, Spinoza, Locke, Berkeley, Kant, Hegel, Nietzsche, Royce, James, Dewey, Whitehead, and others. Without these people and their thoughts, philosophy would not have the rich content it has today. Even though we may be unconscious of the fact, we are constantly influenced by ideas that have come down to us in the traditions of society.

Core Fields of Philosophy

Lesson 3: Metaphysics and Epistemology

Lesson Overview

Dear learners, we have said earlier that philosophy is a rational and critical enterprise that tries to formulate and answer fundamental questions through an intensive application of reason- an application that draws on analysis, comparison, and evaluation. It deals with the most basic issues faced by human beings. The content of philosophy is better seen as asking the right questions rather than providing the correct answers. It even can be said that philosophy is the *study of questions*. Van Cleve Morris has noted that the crux of the matter is asking the "*right*" questions. By "*right*" he meant questions that are meaningful and relevant- the kind of questions people really want answered and that will make a difference in how they live and work. Philosophy has different primary and secondary branches. This course deals only with the primary ones, namely Metaphysics, Epistemology, Axiology, and Logic. Metaphysics is the most important fields of philosophy that deal with the studies of ultimate reality and human knowledge, respectively.

In this lesson, we will discuss the first two major fields, Metaphysics and Epistemology, and we will deal with the remaining two fields, Axiology and Logic, in the next lesson (Lesson 4).

Lesson Objectives:

After a successful completion of this lesson, you will be able to:

- Understand the fundamental concern and issues that metaphysics and epistemology primarily deal with.
- Identify the major subsets or aspects of metaphysical questions.
- Recognize the fundamental philosophical, i.e., epistemological, debates concerning the sources of human knowledge.

3.1 Metaphysics

Activity # 1: - *Dear learners, what do you think is metaphysics? List any question that you might think is a metaphysical question. Show your question to student(s) beside you, and discuss about your questions together.*

Metaphysics is the branch of philosophy that studies the ultimate nature of reality or existence. It deal with issues of reality, God, freedom, soul/immortality, the mind-body problem, form and substance relationship, cause and effect relationship, and other related issues. Metaphysicians seek an irreducible foundation of reality or 'first principles' from which absolute knowledge or truth can be induced and deduced. The term *metaphysics* is derived from the Greek *words "meta" means* ("beyond", "upon" or "after") *and physika*, means ("physics"). Literally, it refers 'those things after the physics.' Aristotle's writings on 'first philosophy' came after his treatise on physics, therefore, Aristotle's editor, Andronicus of Rhodes, named them metaphysics.

Here are some of the questions that Metaphysics primarily deals with:

- *What is reality?*
- *What is the ultimately real?*
- *What is the nature of the ultimate reality?*
- *Is it one thing or is it many different things?*
- *Can reality be grasped by the senses, or it is transcendent?*
- *What makes reality different from a mere appearance?*
- *What is mind, and what is its relation to the body?*
- *Is there a cause and effect relationship between reality and appearance?*
- *Does God exist, and if so, can we prove it?*
- *Are human actions free, or predetermined by a supernatural force?*
- *What is human being? A thinking mind? A perishable body? Or a combination of both?*
- *What is time?*
- *What is the meaning of life?*

At first, questions like, 'What is real?' seem too simple to bother asking. But consider George Knight's example about the existence of a floor and one will see that the question has far reaching implications: What is exactly the nature of the floor upon which you stand? It may seem to have a

rather straightforward existence. It is obviously flat, solid, and smooth; it has a particular color; it is composed of an identifiable material, such as wood or concrete; and it supports your weight. Suppose, however, that a physicist enters the room and questioned about the reality of the floor. She will reply that the floor is made of molecules; that molecules consist of atoms, electrons, protons, and neutrons; and these, finally, of electric energy alone. A third position is offered by a passing chemist. To him the floor is a hotbed of hydrocarbons associated in a particular way and subject to certain kinds of environmental influences, such as heat, cold, wetness, dryness, and oxidation.

It is evident that the question of reality is not as simplistic as it appears. If the reality of a common floor is confusing, what about the larger problems that presents themselves as humankind searches for the ultimate reality of the universe?

Metaphysical questions are the most basic to ask because they provide the foundation upon which all subsequent inquiry is based. Metaphysical questions may be divided into four subsets or aspects.

i) ***Cosmological Aspect*:** Cosmology consists in the study of theories about the origin, nature, and development of the universe as an orderly system. Questions such as these populate the realm of cosmology: "How did the universe originate and develop? Did it come about by accident or design? Does its existence have any purpose?"

ii) ***Theological Aspect:*** Theology is that part of religious theory that deals with conceptions of and about God. "Is there a God? If so, is there one or more than one? What are the attributes of God? If God is both all good and all powerful, why does evil exist? If God exists, what is His relationship to human beings and the 'real' world of everyday life?"

iii) ***Anthropological Aspect:*** Anthropology deals with the study of human beings and asks questions like the following: What is the relation between mind and body? Is mind more fundamental than body, with body depending on mind, or vice versa? What is humanity's moral status? Are people born good, evil, or morally neutral? To what extent are individuals free? Do they have free will, or are their thoughts and actions determined by their environment, inheritance, or a divine being? Does each person have a soul? If so, what

is it? People have obviously adopted different positions on these questions, and those positions influence their political, social, religious, and educational ideals and practices.

iv) ***Ontological Aspect:*** Ontology is the study of the nature of existence, or what it means for anything to exist. Several questions are central to ontology: "Is basic reality found in matter or physical energy (the world we can sense), or is it found in spirit or spiritual energy? Is it composed of one element (e.g., matter or spirit), or two (e.g., matter and spirit), or many?" "Is reality orderly and lawful in itself, or is it merely orderable by the human mind? Is it fixed and stable, or is change its central feature? Is this reality friendly, unfriendly, or neutral toward humanity?"

3.2 Epistemology

Activity # 2: - *Dear learners, what do you think is epistemology? List any question that you might think is an epistemological question. Show your question to student(s) beside you, and discuss about your questions together.*

Epistemology is the other field of philosophy that studies about the nature, scope, meaning, and possibility of knowledge. It deals with issues of knowledge, opinion, truth, falsity, reason, experience, and faith. Epistemology is also referred to as "theory of knowledge".

Etymologically, the word epistemology has been derived from the Greek words *episteme*, meaning "knowledge, understanding", and *logos*, meaning "study of". In other words, we can say that Epistemology is the study of the nature, source, and validity of knowledge. It seeks to answer of the basic questions as "What is true?" and "How do we know?" Thus, epistemology covers two areas: the *content* of thought and *thought* itself. The study of epistemology deals with issues related to the dependability of knowledge and the validity of the sources through which we gain information.

The following are among the questions/issues with which Epistemology deals:

- *What is knowledge?*
- *What does it mean to know?*
- *What is the source of knowledge? Experience? Reason? Or both?*
- *How can we be sure that what we perceive through our senses is correct?*

- *What makes knowledge different from belief or opinion?*
- *What is truth, and how can we know a statement is true?*
- *Can reason really help us to know phenomenal things without being informed by sense experiences?*
- *Can our sense experience really help us to know things beyond our perception without the assistance of our reasoning ability?*
- *What is the relationship and difference between faith and reason?*

Epistemology seeks answers to a number of fundamental issues. One is whether reality can even be known. *Skepticism* in its narrow sense is the position claiming that people cannot acquire reliable knowledge and that any search for truth is in vain. That thought was well expressed by Gorgias, the Greek Sophist who asserted that nothing exists, and that if it did, we could not know it. A full-blown skepticism would make intelligent action impossible. A term closely related to skepticism is *agnosticism*. Agnosticism is a profession of ignorance in reference to the existence or nonexistence of God.

Most people claim that reality can be known. However, once they have taken that position, they must decide through what sources reality may be known, and must have some concept of how to judge the validity of their knowledge. A second issue foundational to epistemology is whether all truth is relative, or whether some truths are absolute. Is all truth subject to change? Is it possible that what is true today may be false tomorrow? If the answer is "Yes" to the previous questions, such truths are relative. If, however, there is Absolute Truth, such Truth is eternally and universally true irrespective of time or place. Closely related to the issue of the relativity and absoluteness of truth are the questions of whether knowledge is subjective or objective, and whether there is truth that is independent of human experience.

A major aspect of epistemology relates to the sources of human knowledge. If one accepts the fact that there is truth and even Truth in the universe, how can human beings comprehend such truths? How do they become human knowledge? Central to most people's answer to that question is ***empiricism*** (knowledge obtained through the senses). Empirical knowledge appears to be built into the very nature of human experience. Thus, when individuals walk out of doors on a spring day and see the beauty of the landscape, hear the song of a bird, feel the warm rays of the sun, and

smell the fragrance of the blossoms, they "know" that it is spring. Sensory knowing for humans is immediate and universal, and in many ways forms the basis of much of human knowledge.

The existence of sensory data cannot be denied. Most people accept it uncritically as representing "reality." The danger of naively embracing this approach is that data obtained from the human senses have been demonstrated to be both incomplete and undependable. (For example, most people have been confronted with the contradiction of seeing a stick that looks bent when partially submerged in water but appears to be straight when examined in the air.) Fatigue, frustration, and illness also distort and limit sensory perception. In addition, there are sound and light waves that are inaudible and invisible to unaided human perception.

Humans have invented scientific instruments to extend the range of their senses, but it is impossible to ascertain the exact dependability of these instruments since no one knows the total effect of the human mind in recording, interpreting, and distorting sensual perception. Confidence in these instruments is built upon speculative metaphysical theories whose validity has been reinforced by experimentation in which predictions have been verified through the use of a theoretical construct or hypothesis. In general, sensory knowledge is built upon assumptions that must be accepted by faith in the dependability of human sensory mechanisms. The advantage of empirical knowledge is that many sensory experiences and experiments are open to both replication and public examination.

A second important source of human knowledge is reason. The view that reasoning, thought, or logic is the central factor in knowledge is known as ***rationalism***. The rationalist, in emphasizing humanity's power of thought and the mind's contributions to knowledge, is likely to claim that the senses alone cannot provide universal, valid judgments that are consistent with one another. From this perspective, the sensations and experiences humans obtain through their senses are the raw material of knowledge. These sensations must be organized by the mind into a meaningful system before they become knowledge. Rationalism in a less extreme form claims that people have the power to know with certainty various truths about the universe that the senses alone cannot give. In its extreme form, rationalism claims that humans are capable of arriving at irrefutable knowledge independently of sensory experience. Formal logic is a tool used by rationalists. Systems of logic have the advantage of possessing internal consistency, but they risk being

disconnected from the external world. Systems of thought based upon logic are only as valid as the premises upon which they are built.

A third source of human knowledge is ***intuition***- the direct apprehension of knowledge that is not derived from conscious reasoning or immediate sense perception. In the literature dealing with intuition, one often finds such expressions as "immediate feeling of certainty." Intuition occurs beneath the threshold of consciousness and is often experienced as a sudden flash of insight. Intuition has been claimed under varying circumstances as a source of both religious and secular knowledge. Certainly many scientific breakthroughs have been initiated by intuitive hunches that were confirmed by experimentation. The weakness or danger of intuition is that it does not appear to be a safe method of obtaining knowledge when used alone. It goes astray very easily and may lead to absurd claims unless it is controlled by or checked against other methods of knowing. Intuitive knowledge, however, has the distinct advantage of being able to bypass the limitations of human experience.

A fourth influential source of knowledge throughout the span of human history has been ***revelation***. Revealed knowledge has been of prime importance in the field of religion. It differs from all other sources of knowledge because it presupposes a transcendent supernatural reality that breaks into the natural order. Christians believe that such revelation is God's communication concerning the divine will. Believers in supernatural revelation hold that this form of knowledge has the distinct advantage of being an omniscient source of information that is not available through other epistemological methods. The truth revealed through this source is believed by Christians to be absolute and uncontaminated. On the other hand, it is generally realized that distortion of revealed truth can occur in the process of human interpretation. Some people assert that a major disadvantage of revealed knowledge is that it must be accepted by faith and cannot be proved or disproved empirically.

A fifth source of human knowledge, though not a philosophical position, is ***authority***. Authoritative knowledge is accepted as true because it comes from experts or has been sanctified over time as tradition. In the classroom, the most common source of information is some authority, such as a textbook, teacher, or reference work. Accepting authority as a source of knowledge has its advantages as well as its dangers. Civilization would certainly stagnate if people refused to

accept any statement unless they personally verified it through direct, firsthand experience. On the other hand, if authoritative knowledge is built upon a foundation of incorrect assumptions, then such knowledge will surely be distorted.

Dear learners, it is important to note that one source of information alone might not be capable of supplying people with all knowledge. It might be important to see the various sources as complementary rather than antagonistic. However, it is true that most people choose one source as being more basic than, or preferable to, the others, and then use it as a benchmark for testing other sources of knowledge. For example, in the contemporary world, knowledge obtained empirically is generally seen as the most basic and reliable type.

Lesson 4: Axiology and Logic

Lesson Overview

We have said earlier that philosophy deals with the most basic issues faced by human beings. Axiology is the philosophical study of value, which originally meant the worth of something. It includes the studies of moral values, aesthetic values, as well as political and social values. Logic, on the other hand, is a philosophical study of arguments and the methods and principles of right reasoning. In this lesson, we will discuss Axiology and Logic as the other two major fields of philosophy.

Lesson Objectives:

After a successful completion of this lesson, you will be able to:

- Understand the fundamental concern and issues that axiology and logic primarily deal with.
- Identify the major subsets or aspects of axiological questions: ethical, aesthetical, political and social questions.
- Recognize the fundamental philosophical debates concerning the nature and sources of moral, political and social rules and principles.

4.1 Axiology

> ***Activity # 1: -*** *Dear learners, what do you think is Axiology? List any question that you might think is an axiological question. Show your question to student(s) beside you, and discuss about your questions together.*

Axiology is the study or theory of value. The term Axiology stems from two Greek words- "Axios", meaning "value, worth", and "logos", meaning "reason/ theory/ symbol / science/study of". Hence, Axiology is the philosophical study of value, which originally meant the worth of something. Axiology asks the philosophical questions of values that deal with notions of what a person or a society regards as good or preferable, such as:

- *What is a value?*
- *Where do values come from?*
- *How do we justify our values?*
- *How do we know what is valuable?*
- *What is the relationship between values and knowledge?*
- *What kinds of values exist?*
- *Can it be demonstrated that one value is better than another?*
- *Who benefits from values?*
- *Etc.*

Axiology deals with the above and related issues of value in three areas, namely *Ethics, Aesthetics, and Social/Political Philosophy*.

I. Ethics

> ***Activity # 2: -*** *Dear learners, how do you define ethics? What ethical rules, principles, and standards do you know and follow, and why? Discuss about it with the student(s) beside you.*

Ethics, which is also known as *Moral Philosophy*, is a science that deals with the philosophical study of moral principles, values, codes, and rules, which may be used as standards for determining what kind of human conduct/action is said to be good or bad, right or wrong. Ethics has three main

branches: meta-ethics, normative ethics, and applied ethics. Ethics raises various questions including:

- *What is good/bad?*
- *What is right/wrong?*
- *Is it the Right Principle or the Good End that makes human action/conduct moral?*
- *Is an action right because of its good end, or it is good because of its right principle?*
- *Are moral principles universal, objective, and unconditional, or relative, subjective and conditional?*
- *What is the ultimate foundation of moral principles? The supernatural God? Human reason? Mutual social contract? Social custom?*
- *Does God exist? If so, is He Benevolent and Omnipotent?*
- *If God is Benevolent, why He creates evil things? If God does not create evil things, then, there must be another creator who is responsible to creation of the evil things? But, if it is so, how can God be an Omnipotent creator?*
- *Why we honor and obey moral rules? For the sake of our own individual benefits?, or for the sake of others?, or just for the sake of fulfilling our infallible duty?*

Ethics, or ethical studies, can be grouped into three broad categories: *Normative ethics, Meta-ethics,* and *Applied Ethics.*

Normative Ethics refers to the ethical studies that attempt to study and determine precisely the moral rules, principles, standards and goals by which human beings might evaluate and judge the moral values of their conducts, actions and decisions. It is the reasoned search for principles of human conduct, including a critical study of the major theories about which things are good, which acts are right, and which acts are blameworthy. *Consequentialism or Teleological Ethics*, *Deontological Ethics*, and *Virtue Ethics* are the major examples of normative ethical studies.

Meta-ethics is the highly technical philosophical discipline that deals with investigation of the meaning of ethical terms, including a critical study of how ethical statements can be verified. It is more concerned with the meanings of such ethical terms as *good* or *bad and right or wrong* than with what we think is good or bad and right or wrong. *Moral Intuitionism, Moral Emotivism, Moral Prescriptivism, Moral Nihilism,* and *Ethical Relativism* are the main examples of meta-ethical studies.

Applied Ethics is a normative ethics that attempts to explain, justify, apply moral rules, principles, standards, and positions to specific moral problems, such as capital punishment, euthanasia, abortion, adultery, animal right, and so on. This area of normative ethics is termed applied because the ethicist applies or uses general ethical princes in an attempt to resolve specific moral problems.

II. Aesthetics

Activity # 3: - *Dear learners, how do you define and understand aesthetics? What Discuss about it with the student(s) beside you.*

Aesthetics is the theory of beauty. It studies about the particular value of our artistic and aesthetic experiences. It deals with beauty, art, enjoyment, sensory/emotional values, perception, and matters of taste and sentiment.

The following are typical Aesthetic questions:

- *What is art?*
- *What is beauty?*
- *What is the relation between art and beauty?*
- *What is the connection between art, beauty, and truth?*
- *Can there be any objective standard by which we may judge the beauty of artistic works, or beauty is subjective?*
- *What is artistic creativity and how does it differ from scientific creativity?*
- *Why works of art are valuable?*
- *Can artistic works communicate? If so, what do they communicate?*
- *Does art have any moral value, and obligations or constraints?*
- *Are there standards of quality in Art?*

III. Social/Political Philosophy

Activity # 4: - *Dear learners, how do you define politics and society? What political and social rules, principles, and standards do you know and follow, and why? Discuss about it with the student(s) beside you.*

Social/Political Philosophy studies about of the value judgments operating in a civil society, be it social or political.

The following questions are some of the major Social/Political Philosophy primarily deal with:

- *What form of government is best?*
- *What economic system is best?*
- *What is justice/injustice?*
- *What makes an action/judgment just/unjust?*
- *What is society?*
- *Does society exist? If it does, how does it come to existence?*
- *How are civil society and government come to exist?*
- *Are we obligated to obey all laws of the State?*
- *What is the purpose of government?*

4.2 Logic

Activity # 5: - *Dear learners, how do you define and understand logic? Discuss about it with student(s) beside you.*

Logic is the study or theory of principles of right reasoning. It deals with formulating the right principles of reasoning; and developing scientific methods of evaluating the validity and soundness of arguments. The following are among the various questions raised by Logic:

- *What is an argument; What does it mean to argue?*
- *What makes an argument valid or invalid*
- *What is a sound argument?*
- *What relation do premise and conclusion have in argument?*
- *How can we formulate and evaluate an argument?*

What is a fallacy?; What makes an argument fallacious?

Lesson 5: Importance of Learning Philosophy

Lesson Overview

Dear learners, we have seen in our first lesson that philosophy is a rational and critical enterprise that tries to formulate and answer fundamental questions through an intensive application of reason- an application that draws on analysis, comparison, and evaluation-, and deals with the most basic issues faced by human beings. In this lesson, we will discuss the fundamental benefits of learning philosophy.

Lesson Objectives:

After a successful completion of this lesson, you will be able to:

- Understand the fundamental benefits philosophy could provide to humanity.

Activity # 1: - *Dear learners, can you list, based on our previous lessons, the possible benefits of studying philosophy? Who do you think needs philosophy? Why? Discuss with the student(s) beside you.*

Dear learners, if you ask any philosophy student 'what is the necessity of studying philosophy', he/she may give you the following famous philosophical statement: "***The unexamined life is not worth living***". The ancient Greek philosopher, Socrates, once said that *"I tell you that to let no day pass without discussing goodness and all the other subjects about which you hear me talking and examining both myself and others is really the best thing that a man can do, and that life without this sort of examination is not worth living…"* Thus, among the various benefits of learning philosophy is that philosophy provides students with the tools they need to critically examine their own lives as well as the world in which they live. Let us clarify it more.

Some modern psychologists point out that human beings have both *maintenance* and *actualizing* needs. The former refer to the physical and psychological needs that we must satisfy in order to maintain ourselves as human beings: food, shelter, security, social interaction, and the like. The later appear to be associated with self-fulfillment, creativity, self-expression, realization of one's potential, and being everything one can be. Although philosophy may not necessarily lead to this

sort of self-actualization, it can assist us to actualize ourselves by promoting the ideal of self-actualization. There are many characteristics of self-actualization to whose achievement studying philosophy has a primordial contribution. Here below are some of them.

1) *Intellectual and Behavioral Independence:-* This is the ability to develop one's own opinion and beliefs. Among the primary goals of philosophy, one is the integration of experiences into a unified, coherent, and systematic world views. Studying philosophy helps us not only to know the alternative world views but also to know how philosophers have ordered the universe for themselves. As a result, we can learn how to develop and integrate our experiences, thoughts, feelings, and actions for ourselves, and thus how to be intellectually and behaviorally independent.
2) *Reflective Self-Awareness:-* self-actualization cannot be realized without a clear knowledge of oneself and the world in which one lives. Philosophy helps us to intensify our self-awareness by inviting us to critically examine the essential intellectual grounds of our lives.
3) *Flexibility, Tolerance, and Open-Mindedness:-* by studying different philosophical perspectives we can understand the evolutionary nature of intellectual achievement and the ongoing development of human thought. As we confront with the thoughts of various philosophers we can easily realize that no viewpoint is necessarily true or false- that the value of any attitude is contextual. Finally, we become more tolerant, open-minded, more receptive, and more sympathetic to views that contend or clash with ours.
4) *Creative and Critical Thinking:* - this is the ability to develop original philosophical perspective on issues, problems, and events; and to engage them on a deeper level. From the study of philosophy, we can learn how to refine our powers of analysis, our abilities to think critically, to reason, to evaluate, to theorize, and to justify.
5) *Conceptualized and well-thought-out value systems in morality, art, politics, and the like:* - since philosophy directly deals with morality, art, politics, and other related value theories, studying philosophy provides us with an opportunity to formulate feasible evaluations of value; and thereby to find meaning in our lives.

The other benefit of studying philosophy that should not be missed is that it helps us to deal with ***the uncertainty of living***. Philosophy helps us to realize the absence of an absolutely ascertained

knowledge. But, what is the advantage of uncertainty? What Bertrand Russell stated in his book, The *Problem of Philosophy*, can be a sufficient answer for this question.

> *The value of philosophy is, in part, to be sought largely in its very uncertainty. The man who has no tincture of philosophy goes through life imprisoned in the prejudices derived from common sense, from the habitual benefits of his age or his nation, and from convictions which have grown up in his mind without the cooperation or consent of his deliberate reason. To such a man the world tends to become definite, finite, obvious; common objects rouse no questions, and unfamiliar possibilities are contemptuously rejected. As soon as we begin to philosophize, on the contrary, we find… that even the most everyday things lead to problems to which only very incomplete answers can be given. Philosophy, though unable to tell us with certainty what is the true answer to the doubts which it raises, is able to suggest many possibilities which enlarge our thoughts and free them from the tyranny of custom. Thus, while diminishing our feeling of certainty as to what things are, it greatly increases our knowledge as to what they may be; it removes the somewhat arrogant dogmatism of those who have never traveled into the region of liberating doubt, and it keeps alive our sense of wonder by showing familiar things in an unfamiliar aspect (*Bertrand, 1912, P; 158).

Chapter Summary

Logic, as a field of study, is a branch of philosophy that deals with the study of arguments and the principles and methods of right reasoning. Etymologically, the term 'philosophy' can be defined as ***"love of wisdom"***, being wisdom a critical habit and eternal vigilance about all things and a reverence for truth, whatever its form, and wherever its place. Therefore, philosophy, as a pursuit of wisdom, is the development of critical habits, the continuous search for truth, and the questioning of the apparent. It is, however, important to note that 'questioning the apparent' does not mean denying the obviously real. It simply refers to the extraordinary ability and curiosity to deal creatively with the phenomenal world, to go beyond the common understanding, and to speculate about things that other people accept with no doubt. Philosophy, as a rational and critical enterprise that tries to formulate and answer fundamental questions through an intensive application of reason, is a dual-sided universal discipline: *critical* and *constructive* sides. While, as a critical discipline, it deals with giving a rational critic, analysis, clarification, and evaluation of answers given to basic metaphysical, epistemological, and axiological questions, it attempts, as a constructive discipline, to formulate rationally defensible answers to certain fundamental questions concerning the nature of reality, the nature of value, and the nature of knowledge and truth.

Philosophy, as an academic discipline, has its own salient features that distinguish it from other academic disciplines. Its systematic, logical and flexible approach to the ultimate reality of the universe, human life, knowledge experience, truth and values and its holistic and evolutionary nature are some the fundamental features of philosophy. Philosophy uses its major branches to deal with the most important issues human beings face, namely *Metaphysics, Epistemology, Axiology*, and *Logic*. Metaphysics deals with the studies of ultimate reality and existence. Epistemology deals with the study of the meaning, nature, source, scope and possibility of human knowledge. Axiology deals with the philosophical studies of human values, such as moral values, aesthetic values, as well as political and social values. Logic, on the other hand, is a philosophical study of arguments and the methods and principles of right reasoning.

Philosophy provides various fundamental benefits to learners. It provides students with the tools they need to critically examine their own lives as well as the world in which they live, it assist them to actualize themselves by promoting the ideals of self-actualization. That is, studying philosophy helps to achieve the most important characteristic of self-actualization: *Intellectual and Behavioral Independence*, *Reflective Self-Awareness*, *Flexibility, Tolerance, and Open-Mindedness*, *Creative and Critical Thinking*, and *Conceptualized and well-thought-out value systems in morality, art, politics, and the like*. Moreover, studying philosophy helps us to deal with ***the uncertainty of living***, meaning it helps us to realize the absence of an absolutely ascertained knowledge, and hence prepare ourselves to the ever growing human knowledge.

Self Check Exercise

1. Define philosophy as a pursuit of wisdom.

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2. It is said that 'seeking wisdom' is one of the various essences of philosophy. Explain the wisdom that philosophers seek.

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3. List and discuss the major features of philosophy.

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4. Discuss briefly the core branches of philosophy.

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5. Explain the major aspects of metaphysical study.

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6. Discuss the fundamental epistemological debates concerning the source of human knowledge.

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7. Discuss briefly the major branches Ethics or Moral Philosophy.

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8. Discuss the importance of studying philosophy.

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CHAPTER TWO

BASIC CONCEPTS OF LOGIC

Chapter Overview

Logic, as field of study, may be defined as the organized body of knowledge, or science that evaluates arguments. The aim of logic is to develop a system of methods and principles that we may use as criteria for evaluating the arguments of others and as guides in constructing arguments of our own. Argument is a systematic combination of two or more statements, which are classified as a premise or premises and conclusion. A premise refers to the statement, which is claimed to provide a logical support or evidence to the main point of the argument, which h known as conclusion. A conclusion is a statement, which is claimed to follow from the alleged evidence. Depending on the logical and real ability of the premise(s) to support the conclusion, an argument can be either a good argument or a bad argument. However, unlike all kinds of passages, including those that resemble arguments, all arguments purport to prove something.

Arguments can generally be divided into deductive and inductive arguments. A deductive argument is an argument in which the premises are claimed to support the conclusion in such a way that it is impossible for the premises to be true and the conclusion false. On the other hand, an inductive argument is an argument in which the premises are claimed to support the conclusion in such a way that it is improbable that the premises be true and the conclusion false. The deductiveness or inductiveness of an argument can be determined by the particular indicator word it might use, the actual strength of the inferential relationship between its component statements, and its argumentative form or structure.

A deductive argument can be evaluated by its validity and soundness. Likewise, an inductive argument can be evaluated by its strength and cogency. Depending on its actually ability to successfully maintain its inferential claim, a deductive argument can be either valid or invalid. That is, if the premise(s) of a certain deductive argument actually support its conclusion in such a way that it is impossible for the premises to be true and the conclusion false, then that particular deductive argument is valid. If, however, its premise(s) actually support its conclusion in such a

way that it is possible for the premises to be true and the conclusion false, then that particular deductive argument is invalid. Similarly, an inductive argument can be either strong or weak, depending on its actually ability to successfully maintain its inferential claim. That is, if the premise(s) of a certain inductive argument actually support its conclusion in such a way that it is improbable for the premises to be true and the conclusion false, then that particular inductive argument is strong. If, however, its premise(s) actually support its conclusion in such a way that it is probable for the premises to be true and the conclusion false, then that particular inductive argument is weak.

Furthermore, depending on its actually ability to successfully maintain its inferential claim as well as its factual claim, a deductive argument can be either sound or unsound. That is, if a deductive argument actually maintained its inferential claim, (i.e., if it is valid), and its factual claim, (i.e., if all of its premises are true), then that particular deductive argument will be a sound argument. However, if it fails to maintain either of its claims, it will be an unsound argument. Likewise, depending on its actually ability to successfully maintain its inferential claim as well as its factual claim, an inductive argument can be either cogent or uncogent. That is, if an inductive argument actually maintained its inferential claim, (i.e., if it is strong), and its factual claim, (i.e., if all of its premises are probably true), then that particular inductive argument will be a cogent argument. However, if it fails to maintain either of its claims, it will be an uncogent argument. In this chapter, we will discuss logic and its basic concepts, the techniques of distinguishing arguments from non-argumentative passages, and the types of arguments.

Chapter Objectives:

Dear learners, after the successful completion of this chapter, you will be able to:

- Understand the meaning and basic concepts of logic;
- Understand the meaning, components, and types of arguments; and
- Recognize the major techniques of recognizing and evaluating arguments.

Lesson 1: Basic Concepts of Logic: Arguments, Premises and Conclusions

Lesson Overview

Logic is generally be defined as a philosophical science that evaluates arguments. An argument is a systematic combination of one or more than one statements, which are claimed to provide a logical support or evidence (i.e., premise(s) to another single statement which is claimed to follow logically from the alleged evidence (i.e., conclusion). An argument can be either good or bad argument, depending on the logical ability of its premise(s) to support its conclusion. The primary aim of logic is to develop a system of methods and principles that we may use as criteria for evaluating the arguments of others and as guides in constructing arguments of our own. The study of logic increases students' confidence to criticize the arguments of others and advance arguments of their own. In this lesson, we will discuss the meaning and basic concepts of logic: arguments, premises, and conclusions.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Understand the meaning.
- Identify the subject matter of logic.
- Understand the meaning of an argument.
- Identify the components of an argument.
- Understand the meaning and nature of a premise.
- Comprehend the meaning and nature of a conclusion.
- Recognize the techniques of identifying the premises and conclusion of an argument.

What is the Meaning of Logic?

Activity # 1: - *Dear learners, how do you define Logic?*

Dear learners, the word logic comes from Greek word *logos*, which means sentence, discourse, reason, truth and rule. Logic in its broader meaning is the science, which evaluates arguments and

the study of correct reasoning. It could be also defined as the study of methods and principles of correct reasoning or the art of correct reasoning.

Logic can be defined in different ways. Here below are some definitions of logic:

- ✓ Logic is a science that evaluates arguments.
- ✓ Logic is the study of methods for evaluating arguments. More precisely, logic is the study of methods for evaluating whether the premises of arguments adequately support or provide a good evidence for the conclusions.
- ✓ Logic is a science that helps to develop the method and principles that we may use as a criterion for evaluating the arguments of others and as a guide to construct good arguments of our own.
- ✓ Logic is the attempt to codify the rules of rational thought. Logicians explore the structure of arguments that preserve truth or allow the optimal extraction of knowledge from evidence.
- ✓ Logic is one of the primary tools philosophers use in their inquiries. The precision of logic helps them to cope with the subtlety of philosophical problems and the often misleading nature of conversational language.

In logic, as an academic discipline, we study reasoning itself: forms of argument, general principles and particular errors, along with methods of arguing. We see lots of mistakes in reasoning in daily life and logic can help us understand what is wrong or why someone is arguing in a particular way.

What is the Benefit of Studying Logic?

"*Logic sharpens and refines our natural gifts to think, reason and argue.*" (*C. S. Layman)*

Activity # 2: - *Dear learners, what do you think is the benefit of studying logic? Discuss with the student(s) beside you.*

We use logic in our day-to-day communications. As human beings, we all think, reason and argue; and we all are subject to the reasoning of other people. Some of us may think well, reason well and argue well, but some of us may not. The ability to think, reason and argue well might partially be a matter of natural gift. However, whatever our natural gifts, they can be refined, improved and sharpened; and the study of logic is one of the best ways to refine one's natural ability to think, reason and argue. Likewise, as academicians, our arguments must be logical and acceptable; and

the tool to do so is provided by logic. In general, the following are some of the major benefits that we can gain from the study of logic:

- It helps us to develop the skill needed to construct sound (good) and fallacy-free arguments of one's own and to evaluate the arguments of others;
- It provides a fundamental defense against the prejudiced and uncivilized attitudes that threaten the foundation of a civilized and democratic society;
- It helps us to distinguish good arguments from bad arguments;
- It helps us to understand and identify the common logical errors in reasoning;
- It helps us to understand and identify the common confusions that often happen due to misuse of language;
- It enables us to disclose ill-conceived policies in the political sphere, to be careful of disguises, and to distinguish the rational from irrational and the sane from the insane and so on.

The aim of logic, hence, is to develop the system of methods and principles that we may use as criteria for evaluating the arguments of others and as guides in constructing the arguments of our own in our day-to-day lives. Thus, by studying logic, we are able to increase our confidence when we criticize the arguments of others and when we advance arguments of our own. In fact, one of the goals of logic is to produce individuals who are critical, rational and reasonable both in the sphere of public and private life. However, to be full beneficial of the worth which logic provides, one must thoroughly and carefully understand the basic concepts of the subject and be able to apply them in the actual situations.

What is an Argument?

Activity # 3: - *Dear learners, what do you think is an argument? What comes to your mind when you think of an argument? Discuss with the student(s) beside you.*

Dear learners, the word 'argument' may not be a new word to all of us. For all of us encounter arguments in our day-to-day experience. We read them in books and newspapers, hear them on television, and formulate them when communicating with friends and associates. If you look back

at the above different definitions of logic and characterizations, you will certainly find one thing in common: *argument*. Moreover, we have said that of the various benefits of studying logic, identifying, analyzing and evaluating arguments is the most important one. It follows that argument the primary subject matter of logic. *What is an argument then?*

Argument is a technical term and the chief concern of logic. Argument might have defined and described in different ways. When we define an arguments from logical point of view, it is a group of statements, one or more of which (the premise) are claimed to provide support for, or reason to believe, one of the other, the (conclusion). As is apparent from the above definition, the term ‘‘argument’’ has a very specific meaning in logic. It does not mean, for example, a mere verbal fight, as one might have with one’s parent, spouse, or friend. Let us examine the features of this definition in detail.

First, *an argument is a group of statements*. That is, the first requirement for a passage to be qualified as an argument is to combine two or more statements. But, *what is a statement?*

A ***statement*** is a declarative sentence that has a truth-value of either true or false. That is, statement is a sentence that has truth-value. Hence, truth and falsity are the two possible truth-values of a statement. A statement is typically a declarative sentence. In other words, statement is a type of sentence that could stand as a declarative sentence. Look the following examples:

a) *Dr. Abiy Ahmed the current Prime Minister of Ethiopia.*
b) *Mekelle is the capital city of Tigray Region.*
c) *Ethiopia was colonized by Germany.*

Statement (a) and (b) are true, because they describe things as they are, or assert what really is the case. Hence, *‘Truth’* is their truth-value. Whereas statement (c) is false because it asserts what is not, and *‘Falsity’* its truth-value.

N.B: Logicians used proposition and statement interchangeably. However, in strict (technical) sense, proposition is the meaning or information content of a statement. In this chapter, the term statement is used to refer premises and a conclusion.

However, there are sentences that are not statements, and hence should be used to construct an argument. Examples:

a) *Would you close the window? (Question)*
b) *Let us study together. (Proposal)*
c) *Right on! (Exclamation)*
d) *I suggest that you read philosophy texts. (Suggestion)*
e) *Give me your ID Card, Now! (Command)*

In fact, sentence is a group of words or phrases that enables us to express ideas or thought meaningfully. However, unlike statements, none of the above sentences can be either true or false. Hence, none of them can be classified as statement. As a result, none of them can make up an argument.

Second, *the statements that make up an argument are divided into premise(s) and conclusion*. That means, the mere fact that a passage contains two or more statements cannot guarantee the existence of an argument. Hence, *an argument is a group statement, which contains at least one premise and one and only one conclusion*. This definition makes it clear that an argument may contain more than one premise but only one conclusion.

Activity # 4: - *Dear learners, if argument is a combination of premise(s) and conclusion, what do you think are premise and conclusion?*

Argument always attempts to justify a claim. The claim that the statement attempts to justify is known as a *conclusion* of an argument; and the statement or statements that supposedly justify the claim is/are known as the *premises* of the argument. Therefore, a ***premise*** is a statement that set forth the reason or evidence, which is given for accepting the conclusion of an argument. It is claimed evidence; and a ***conclusion*** is a statement, which is claimed to follow from the given evidence (premise). In other words, the conclusion is the claim that an argument is trying to establish.

Activity # 5: - *Dear learners, can you now try to construct an argument based on the above definition of an argument?*

Let us now construct arguments together.

Example-1:

1) *All Ethiopians are Africans. (Premise 1)*
   Tsionawit is Ethiopian. (Premise2)
   Therefore, Tsionawit is African. (Conclusion)

Example-2:

2) *Some Africans are black. (Premise-1)*
   Zelalem is an African. (Premise-2)
   Therefore, Zelalem is black. (Conclusion)

In both arguments, the first two statements are premises, because they are claimed to provide evidence for the third statement, whereas the third statement is a conclusion because it is claimed to follow from the given evidences. The claim that the premises support the conclusion, (and/or that the conclusion follow from the premises), is indicated by the word ‘‘therefore.’’

All arguments may be placed in one of two basic groups: those in which the premises really do support the conclusion and those in which they do not, even though they are claimed to. The former are said to be **good** (well-supported) arguments, the latter **bad** (poorly-supported) arguments. For example, compare the above two examples. In the first argument, the premises really do support the conclusion, they give good reason for believing that the conclusion is true, and therefore, the argument is a good one. But the premises of the second argument fail to support the conclusion adequately. Even if they may be true, they do not provide good reason to believe that the conclusion is true. Therefore, it is bad argument, but it is still an argument.

But how can we distinguish premises from conclusion and vice versa?

Despite the purpose of logic, as the science that evaluates and analyses arguments, is to develop methods and techniques that allow us to distinguish good arguments from bad, one of the most important tasks in the analysis of arguments is to distinguish premises from conclusion and vice versa. Sometimes identifying a conclusion from premises is very tough. Premises and conclusions are difficult to identify for a number of reasons. Even though all arguments are ideally presumed

to be composed of premises and a conclusion, in reality, sometimes arguments may contain other sentences as elements. Moreover, even though it is assumed, for the sake of argument, that all arguments are composed of premises and conclusion, identifying conclusion from argument is very difficult. Since it is impossible to analyze arguments without identifying a conclusion from premises, we need techniques that can help us to identify premises from a conclusion and vice versa.

The first technique that can be used to identify premises from a conclusion and vice versa is *looking at an indicator word*. Frequently, arguments contain certain indicator words that provide clues in identifying premises and conclusion.

Here below are some Conclusion Indicators:

Therefore	*We may conclude*	*Thus*	*So*
Wherefore	*Entails that*	*Consequently*	*It follows that*
Accordingly	*Hence*	*We may infer*	
Provided that	*It shows that*	*It implies that*	
It must be that	*Whence*	*As a result*	

In argument that contains any of the conclusion indicator words, the statement that follows the indicator word can usually be identified as the conclusion. By the process of elimination, the other statements in the argument can be identified as premises, but only based on their logical importance to the identified conclusion.

Example:

Women are mammals.

Zenebech is a woman.

Therefore, Zenebech is a mammal.

Based on the above rule, the conclusion of this argument is *"Zenebech is a mammal*" because it follows the conclusion indicator word "therefore", and the other two statements are premises.

If an argument does not contain a conclusion indicator, it may contain a premise indicator.

Here below are some typical Premise Indicators:

Since	*Seeing that*	*In that*
As indicated by	*Given that*	*May be inferred from*
Because	*As*	*Inasmuch as*
Owing to	*For*	*For the reason that*

In argument that contains any of the premise indicator words, a statement that follows the indicator word can usually be identified as a premise. By same the process of elimination, the other remaining single statement will be a conclusion.

Example:

You should avoid any form of cheating on exams ***because*** *cheating on exams is punishable by the Senate Legislation of the University*.

Based on the above rule, the premise of this argument is *"cheating on exams is punishable by the Senate Legislation of the University*" because it follows the premise indicator word "because", and the other statement is a premise.

One premise indicator not included in the above list is ''*for this reason*.'' This indicator is special in that it comes immediately *after* the premise it indicates and before the conclusion. We can say that in the middle place between the premise and the conclusion, this indicator can be both premise and conclusion indicator. The statement that comes before ''for this reason'' is the premise of an argument and the statement that comes after "for this reason" is the conclusion. One should be careful not to confuse ''for this reason'' with ''for the reason that.''

Sometimes a single indicator can be used to identify more than one premise. Consider the following argument:

Tsionawit is a faithful wife, for Ethiopian women are faithful wives and Tsionawit an Ethiopian.

The premise indicator ‘‘for’’ goes with both ‘‘*Ethiopian women are faithful wives*’’ and ‘‘*Tsionawit is an Ethiopian”.* These are the premises. By process of elimination, ‘‘*Tsionawit is a faithful wife*” is the conclusion.

Sometimes you may an argument that contains no indicator all: neither a conclusion indicator word nor a premise indicator word. When this occurs, the reader/ listener must ask himself or herself such questions as:

- ✓ What single statement is claimed (implicitly) to follow from the others?
- ✓ What is the arguer trying to prove?
- ✓ What is the main point in the passage?

The answers to these questions should point to the conclusion.

Example:

Our country should increase the quality and quantity of its military. Ethnic conflicts are recently intensified; boarder conflicts are escalating; international terrorist activities are increasing.

The main point of this argument is to show that the country should increase the size and quality of its military. All the rest are given in support of the conclusion. As you can see there are no indicator words. The following is the standard form of this argument:

Ethnic conflicts are recently intensified. (P-1)
Boarder conflicts are escalating. (P-2)
International terrorist activities are increasing. (P-3)
Thus, the country should increase the quality and quantity of its military. (C)

Passages that contain arguments sometimes contain statements that are neither premises nor conclusion. Only statements that are actually intended to support the conclusion should be included in the list of premises. If a statement has nothing to do with the conclusion or, for example, simply makes a passing comment, it should not be included within the context of the argument.

Example:

Socialized medicine is not recommended because it would result in a reduction in the overall quality of medical care available to the average citizen. In addition, it might very well bankrupt the federal treasury. This is the whole case against socialized medicine in a nutshell.

The conclusion of this argument is ‘‘*Socialized medicine is not recommended*,’’ and the two statements following the word ‘‘because’’ are the premises. The last statement makes only a passing comment about the argument itself and is therefore neither a premise nor a conclusion.
Inference is another concept. In the narrower sense it means the reasoning process expressed by the argument. And broadly it refers the argument itself. For the purpose of this course, we use the narrower sense of the term inference or inferential link between the premises and the conclusion of arguments.

Lesson 2: Techniques of Recognizing Arguments

Lesson Overview

An argument is a systematic combination of one or more than one statements, which are claimed to provide a logical support or evidence (i.e., premise(s) to another single statement which is claimed to follow logically from the alleged evidence (i.e., conclusion). However, not all passages that contain two or more statements are argumentative. There are various passages that contain two or more statements but are not argumentative. Argumentative arguments are distinguished from such kind of passages by their primary goal: proving something. In this lesson, we will see the techniques of distinguishing argumentative passages from non-argumentative passages.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Recognize argumentative passages.
- Recognize non-argumentative passages.
- Distinguish argumentative passages from non-argumentative passages.
- Understand the concepts inferential claim and factual claim.

2.1 Recognizing Argumentative Passages

Activity # 1: - *Dear learners, what do you think are argumentative passages? What qualifies a passage to be an argument?*

Evaluating arguments about different issues in human life like those that address, religion, politics, ethics, sport, science, love, culture, environment, society, culture etc. is the central concern of logic. Therefore, as logicians, in order to evaluate arguments easily, we need to understand the nature of arguments and further we need to understand what argument is not, because not all passages contain argument. Since logic deals with arguments, it is important for students to develop the ability to identify whether passages contain an argument. In a general way, a passage contains an argument if it purports to prove something; if it does not do so, it does not contain an argument.

But what does it mean to purport to prove something?

Two conditions must be fulfilled for a passage to purport to prove something:

1) *At least one of the statements must claim to present evidence or reasons.*
2) *There must be a claim that the alleged evidence or reasons supports or implies something- that is, a claim that something follows from the alleged evidence.*

As we have seen earlier, the statements that claim to present the evidence or reasons are the premises and the statement that the evidence is claimed to support or imply is the conclusion. Hence, the first condition refers to premises as it tries to provide or claim to provide reasons or evidences for the conclusion; and the second condition refers to a conclusion. It is not necessary that the premises present actual evidence or true reasons nor that the premises actually do support the conclusion. But at least the premises must claim to present evidence or reasons, and there must be a claim that the evidence or reasons support or imply something.

The first condition expresses a ***factual claim,*** and deciding whether it is fulfilled often falls outside the domain of logic. Thus, most of our attention will be concentrated on whether the second condition is fulfilled. The second condition expresses what is called an ***inferential claim.*** The

inferential claim is simply the claim that the passage expresses a certain kind of reasoning process- that something supports or implies something or that something follows from something. Also, you should recognize that this claim is not equitable with the intentions of the arguer. Intentions are subjective and, as such, are usually not accessible to the evaluator. Rather, the inferential claim is an objective feature of an argument grounded in its language or structure. In evaluating arguments, therefore, most of our attention will be concentrated on whether the second condition is fulfilled because it is not necessary, at least at this level, that the premises present actual evidence or true reasons nor that do the premises actually support the conclusion.

An inferential claim can be either ***explicit*** or ***implicit***. An ***explicit inferential claim*** is usually asserted by premise or conclusion indicator words (‘‘thus,’’ ‘‘since,’’ ‘‘because,’’ ‘‘hence,’’ ‘‘therefore,’’ and so on). It exists if there is an indicator word that asserts an explicit relationship between the premises and the conclusions.

Example: *Gamachuu is my biological father, because my mother told so.*

In this example, the premise indicator word “because” expresses the claim that evidence supports something, or that evidence is provided to prove something. Hence, the passage is an argument.

An ***implicit inferential claim*** exists if there is an inferential relationship between the statements in a passage, but the passage contains no indicator words.

Example:

The genetic modification of food is risky business. Genetic engineering can introduce unintended changes into the DNA of the food-producing organism, and these changes can be toxic to the consumer.

The inferential relationship between the first statement and the other two constitutes an implicit claim that evidence supports something, so we are justified in calling the passage an argument though it does not contain indicator word. The first statement is the conclusion, and the other two are the premises.

Sometimes it is difficult to identify whether a passage contain an argument. In deciding whether there is a claim that evidence supports or implies something keep an eye out for (1) *indicator words*, and *(2) the presence of an inferential claim between the statements*. In connection with these points, however, a word of caution is in order.

First, *the mere occurrence of an indicator word by no means guarantees the presence of an argument*. The presence of an indicator word does not mean that the existing indicator word actually and always indicate a premises or a conclusions. Thus, before deciding that an indicator word indicates a premises or a conclusion, make sure that the existing indicator word is used to indicate a premise or a conclusion.

Example:

Since Edison invented the phonograph, there have been many technological developments.

Since Edison invented the phonograph, he deserves credit for a major technological development.

In the first passage the word ‘‘since’’ is used in a temporal sense. It means ‘‘from the time that.’’ Thus, the first passage is not an argument. In the second passage ‘‘since’’ is used in a logical sense, and so the passage is an argument.

Second*, it is not always easy to detect the occurrences of an inferential relationship between statements in a passage, and the reader may have to review a passage several times before making a decision*. Therefore, in deciding whether a passage contains an argument one should try to insert mentally some indicators words among the statements to see whether there is a flow of ideas among the statements. Even with this mental experiment, however, deciding whether a passage contains an argument is very difficult. As a result, not everyone will agree about every passage. Sometimes the only answer possible is a conditional one: “If this passage contains an argument, then these are the premises and that is the conclusion.”

To assists in distinguishing passages that contain arguments from those that do not, it is important to identify passages, which do not contain arguments: Non-argumentative passages.

2.2 Recognizing Non-argumentative Passages

Activity # 2: - *Dear learners, what do you think are non-argumentative passages? What do they lack to be arguments?*

Having seen what arguments are and how we recognize them, we will now focus on what arguments are not and how we recognize them. Non-argumentative passages are passages, which lack an inferential claim. These include simple non-inferential passages, expository passages, illustrations, explanations, and conditional statements. Passages that lack an inferential claim may be statements, which could be premises, conclusion, or both. What is missed is a claim that a reasoning process is being made. As was discussed previously, for a passage to be an argument, it not only should contain premises and a conclusion but also an inferential claim or a reasoning process. In this portion of our lesson, we will discuss some of the most important forms of non-argumentative passages.

Simple Non-inferential Passages

Simple non-inferential passages are unproblematic passages that lack a claim that anything is being proved. Such passages contain statements that could be premises or conclusions (or both), but what is missing is a claim that any potential premise supports a conclusion or that any potential conclusion is supported by premises. Passages of this sort include warnings, pieces of advice, statements of belief or opinion, loosely associated statements, and reports.

A ***warning*** is a form of expression that is intended to put someone on guard against a dangerous or detrimental situation.

Example:

Whatever you promise to tell, never confide political secrets to your wife.

In this passage, no evidence is given to prove that the statement is true; and if no evidence is given to prove that the statement is true, then there is no argument.

A ***piece of advice*** is a form of expression that makes a recommendation about some future decision or course of conduct.

Example:

After class hours, I would suggest that you give careful consideration to the subject matter you have discussed.

As with warnings, there is no evidence that is intended to prove anything in piece of advices, and hence there is no argument in the above passage.

A ***statement of belief*** *or* ***opinion*** is an expression about what someone happens to believe or think about something.

Example:

We believe that our university must develop and produce outstanding students who will perform with great skill and fulfill the demands of our nation.

This passage does not make any claim that the belief or opinion is supported by evidence, or that it supports some conclusion, and hence does not contain an argument.

Loosely associated statements may be about the same general subject, but they lack a claim that one of them is proved by the others.

Example:

Not to honor men of worth will keep the people from contention; not to value goods that are hard to come by will keep them from theft; not to display what is desirable will keep them from being unsettled of mind.

(Lao-Tzu, Thoughts from the Tao Te Ching)

Because there is no claim that any of these statements provides evidence or reasons for believing another, there is no argument.

A ***report*** consists of a group of statements that convey information about some topic or event.

Example:

The great renaissance dam of Ethiopia has opened an employment opportunity for thousands of Ethiopians. In its completion, thirteen thousand Ethiopians are expected to be hired.

These statements could serve as the premises of an argument, but because the author makes no claim that they support or imply anything, there is no argument.

One must be careful, though, with reports about arguments.

Example:

"The Air Force faces a serious shortage of experienced pilots in the years ahead, because repeated overseas tours and the allure of high paying jobs with commercial airlines are winning out over lucrative bonuses to stay in the service," says a prominent Air Force official.

(Newspaper clipping)

Properly speaking, this passage is not an argument, because the author of the passage does not claim that anything is supported by evidence. Rather, the author reports the claim by the Air Force official that something is supported by evidence. If such passages are interpreted as "containing" arguments, it must be made clear that the argument is not the author's but one made by someone about whom the author is reporting.

Expository Passages

An ***expository passage*** is a kind of discourse that begins with a topic sentence followed by one or more sentences that develop the topic sentence. If the objective is not to prove the topic sentence but only to expand it or elaborate it, then there is no argument.

Example:

There is a stylized relation of artist to mass audience in the sports, especially in baseball. Each player develops a style of his own-the swagger as he steps to the plate, the unique windup a pitcher

has, the clean-swinging and hard-driving hits, the precision quickness and grace of infield and outfield, the sense of surplus power behind whatever is done.

(Max Lerner, America as a Civilization)

In this passage the topic sentence is stated first, and the remaining sentences merely develop and flesh out this topic sentence. This passage is not argument, because it lacks an inferential claim. However, expository passages differ from simple non-inferential passages (such as warnings and pieces of advice) in that many of them can also be taken as arguments. If the purpose of the subsequent sentences in the passage is not only to flesh out the topic sentence but also to prove it, then the passage is an argument.

Example:

Skin and the mucous membrane lining the respiratory and digestive tracts serve as mechanical barriers to entry by microbes. Oil gland secretions contain chemicals that weaken or kill bacteria on skin. The respiratory tract is lined by cells that sweep mucus and trapped particles up into the throat, where they can be swallowed. The stomach has an acidic pH, which inhibits the growth of many types of bacteria.

(Sylvia S. Mader, Human Biology, 4th ed.)

In this passage, the topic sentence is stated first, and the purpose of the remaining sentences is not only to show how the skin and mucous membranes serve as barriers to microbes but also to prove that they do this. Thus, the passage can be taken as both an expository passage and an argument.

In deciding whether an expository passage should be interpreted as an argument, try to determine whether the purpose of the subsequent sentences in the passage is merely to develop the topic sentence or also to prove that it is true. In borderline cases, ask yourself whether the topic sentence makes a claim that everyone accepts or agrees with. If it does, the passage is probably not an argument. In real-life situations, authors rarely try to prove something is true when everyone already accepts it. However, if the topic sentence makes a claim that many people do not accept or have never thought about, then the purpose of the remaining sentences may be both to prove the topic sentence is true as well as to develop it. If this be so, the passage is an argument. Finally, if

even this procedure yields no definite answer, the only alternative is may be to say that if the passage is taken as an argument, then the fi rst statement is the conclusion and the others are the premises.

Illustrations

An ***illustration*** is an expression involving one or more examples that is intended to show what something means or how it is done. Illustrations are often confused with arguments because many illustrations contain indicator words such as "thus."

Example:

Chemical elements, as well as compounds, can be represented by molecular formulas. Thus, oxygen is represented by "O_2", water by "H_2O", and sodium chloride by "NaCl".

This passage is not an argument, because it makes no claim that anything is being proved. The word "thus" indicates how something is done - namely, how chemical elements and compounds can be represented by formulas.

However, as with expository passages, many illustrations can be taken as arguments. Such arguments are often called ***arguments from example.*** Here is an instance of one:

Although most forms of cancer, if untreated, can cause death, not all cancers are life-threatening. For example, basal cell carcinoma, the most common of all skin cancers, can produce disfigurement, but it almost never results in death.

In this passage, the example given is intended to prove the truth of "Not all cancers are life-threatening." Thus, the passage is best interpreted as an argument.

In deciding whether an illustration should be interpreted as an argument, determine whether the passage merely shows how something is done or what something means, or whether it also purports to prove something. In borderline cases, it helps to note whether the claim being illustrated is one that practically everyone accepts or agrees with. If it is, the passage is probably not an argument. As already noted, in real-life situations, authors rarely attempt to prove what everyone already

accepts. But if the claim being illustrated is one that many people do not accept or have never thought about, then the passage may be interpreted as an argument.

Thus, in reference to the first example we considered, most people are aware that elements and compounds can be expressed by formulas. For example, practically everyone knows that water is H_2O. But they may not have ever considered whether some forms of cancer are not life-threatening. This is one of the reasons for evaluating the first example as mere illustration and the last one as an argument.

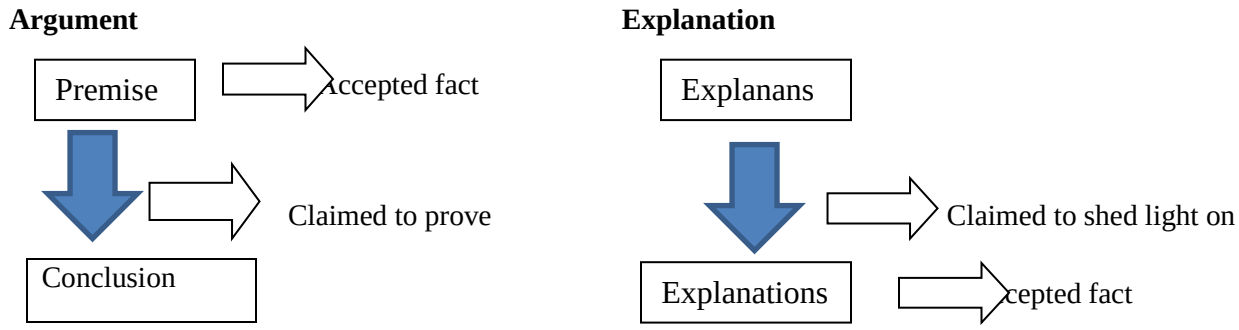
Explanations

One of the most important kinds of non-argument is the explanation. An ***explanation*** is an expression that purports to shed light on some event or phenomenon, which is usually accepted as a matter of fact. It attempts to clarify, or describe such alike why something is happen that way or why something is what it is.

Example:

Cows digest grass while humans cannot, because their digestive systems contain enzyme not found in humans.

Every explanation is composed of two distinct components: the *explanandum* and *explanans*. The ***explanandum*** is the statement that describes the event or phenomenon to be explained, and the ***explanans*** is the statement or group of statements that purports to do the explaining. In the first example, the explanandum is the statement "*Cows digest grass while humans cannot*" and the explanans is "*their [cows'] digestive systems contain enzyme not found in humans*."



Explanations are sometimes mistaken for arguments because they often contain the indicator word "because." Yet explanations are not arguments, because in an explanation the purpose of the explanans is to shed light on, or to make sense of, the explanandum event, not to prove that it occurred. In other words, the purpose of the explanans is to show why something is the case, whereas in an argument, the purpose of the premises is to prove that something is the case. That is, the premise refer to an accepted fact, and intended to prove that something is the case, while the conclusion is a new assertion followed from the already known fact. Moreover, in explanation, we precede backward from fact to the cause whereas in argument we move from premise to the conclusion.

In the above example given, the fact that cows digest grass but humans cannot is readily apparent to everyone. The statement that cows' digestive systems contain enzyme not found in humans is not intended to prove that cows digest grass but humans cannot, but rather to show why it is so.

Explanations bear a certain similarities to an argument. The rational link between the explanandum and explanans may at times resemble the inferential link between the premise and the conclusion of an argument. Thus, to distinguish explanations from arguments, first identify the statement that is either the explanandum or the conclusion (usually this is the statement that precedes the word "because"). If this statement describes an accepted matter of fact, and if the remaining statements purport to shed light on this statement, then the passage is an explanation.

This method usually works to distinguish arguments from explanations. However, some passages can be interpreted as both explanations and arguments.

Example:

Women become intoxicated by drinking a smaller amount of alcohol than men because men metabolize part of the alcohol before it reaches the bloodstream, whereas women do not.

The purpose of this passage could be to prove the first statement to those who do not accept it as fact, and to shed light on that fact to those who do accept it. Alternately, the passage could be intended to prove the first statement to a person who accepts its truth on blind faith or incomplete

experience, and simultaneously to shed light on this truth. Thus, this passage can be correctly interpreted as both an explanation and an argument.

Perhaps the greatest problem confronting the effort to distinguish explanations from arguments lies in determining whether something is an accepted matter of fact. Obviously, what is accepted by one person may not be accepted by another. Thus, the effort often involves determining which person or group of people the passage is directed to- the intended audience. Sometimes the source of the passage (textbook, newspaper, technical journal, etc.) will decide the issue. But when the passage is taken totally out of context, ascertaining the source may prove impossible. In those circumstances the only possible answer may be to say that if the passage is an argument, then such-and-such is the conclusion and such-and-such are the premises.

Conditional Statements

A ***conditional statement*** is an "if . . . then . . ." statement.

Example: *If you study hard, then you will score 'A' grade.*

Every conditional statement is made up of two component statements. The component statement immediately following the "if" is called the ***antecedent (if-clause)***, and the one following the "then" is called the ***consequent (then-clause)***. However, there is an occasion that the order of antecedent and consequent is reversed. That is, when occasionally the word ''then'' is left out, the order of antecedent and consequent is reversed. For example if we left out "then" from the above example the antecedent and consequent is reversed: *You will score 'A' grade if you study hard*. In the above example, the antecedent is "*You study hard*," and the consequent is "*You will score 'A' grade*." In this example, there is a meaningful relationship between antecedent and consequent. However, such a relationship need not exist for a statement to count as conditional. The statement "*If Getaneh Kebede is a singer, then Hawassa is in Mekelle*" is just as much a conditional statement as that in the above example.

Conditional Statements:

Antecedent ***Consequent***

If ---------- ***then*** ----------.

Consequent ***Antecedent***

---------- ***if*** ----------.

Conditional statements are not arguments, because they fail to meet the criteria given earlier. In an argument, at least one statement must claim to present evidence, and there must be a claim that this evidence implies something. In a conditional statement, there is no claim that either the antecedent or the consequent presents evidence. In other words, there is no assertion that either the antecedent or the consequent is true. Rather, there is only the assertion that if the antecedent is true, then so is the consequent. For example, the above example merely asserts that if you study hard, then you will score 'A'. It does not assert that you study hard. Nor does it assert you scored 'A'.

Of course, a conditional statement as a whole may present evidence because it asserts a relationship between statements. Yet when conditional statements are taken in this sense, there is still no argument, because there is then no separate claim that this evidence implies anything. Therefore, a single conditional statement is not an argument. The fact that a statement begin with "if" makes it the idea conditional and not a final reasonable assertion. That is why also conditional statements are not evaluated as true or false without separately evaluating the antecedent and the consequent. They only claim that if the antecedent is true then so is the consequent.

However, some conditional statements are similar to arguments in that they express the outcome of a reasoning process. As such, they may be said to have a certain inferential content. Consider the following example:

If destroying a political competitor gives you joy, then you have a low sense of morality.

The link between the antecedent and consequent resembles the inferential link between the premises and conclusion of an argument. Yet there is a difference because the premises of an

argument are claimed to be true, whereas no such claim is made for the antecedent of a conditional statement. Accordingly, conditional statements are not arguments. Yet, although taken by themselves are not arguments, their inferential content, (the inferential content between the antecedent and the consequent), may be re-expressed to form arguments. For example, the conditional statement can be re-expressed to form an argument as follows:

Destroying a political competitor gives you joy. Therefore, you have a low sense of morality.

Here, we clearly have a premise and conclusion structure, and the conclusion is asserted on the basis of the premise. Therefore, it is argument.

Finally, while no single conditional statement is an argument, a conditional statement may serve as either the premise or the conclusion (or both) of an argument. Observe the following examples:

If he is selling our national secretes to enemies, then he is a traitor.
He is selling our national secretes to enemies.
Therefore, he is a traitor.

If he is selling our national secretes to enemies, then he is a traitor.
If he is a traitor, then he must be punished by death.
Therefore, If he is selling our national secretes to enemies, then he must be punished by death.

The relation between conditional statements and arguments may now be summarized as follows:

1) *A single conditional statement is not an argument.*
2) *A conditional statement may serve as either the premise or the conclusion (or both) of an argument.*
3) *The inferential content of a conditional statement may be re-expressed to form an argument.*

The first two rules are especially pertinent to the recognition of arguments. According to the first rule, if a passage consists of a single conditional statement, it is not an argument. But if it consists of a conditional statement together with some other statement, then, by the second rule, it may be

an argument, depending on such factors as the presence of indicator words and an inferential relationship between the statements.

Conditional statements are especially important in logic (and many other fields) because they express the relationship between necessary and sufficient conditions. A is said to be a ***sufficient condition*** for B whenever the occurrence of A is all that is needed for the occurrence of B. For example, being a dog is a sufficient condition for being an animal. On the other hand, B is said to be a ***necessary condition*** for A whenever A cannot occur without the occurrence of B. Thus, being an animal is a necessary condition for being a dog.

The difference between sufficient and necessary conditions is a bit tricky. So, to clarify the idea further, suppose you are given a large, closed cardboard box. Also, suppose you are told that there is a dog in the box. Then you know for sure, there is an animal in the box. No additional information is needed to draw this conclusion. This means that being a dog is sufficient for being an animal. However, being a dog is not necessary for being an animal, because if you are told that the box contains a cat, you can conclude with equal certainty that it contains an animal. In other words, it is not necessary for the box to contain a dog for it to contain an animal. It might equally well contain a cat, a mouse, a squirrel, or any other animal.

On the other hand, suppose you are told that whatever might be in the box, it is not an animal. Then you know for certain there is no dog in the box. The reason you can draw this conclusion is that being an animal is necessary for being a dog. If there is no animal, there is no dog. However, being an animal is not sufficient for being a dog, because if you are told that the box contains an animal, you cannot, from this information alone, conclude that it contains a dog. It might contain a cat, a mouse, a squirrel, and so on. These ideas are expressed in the following conditional statements:

If X is a dog, then X is an animal.
If X is not an animal, then X is not a dog.

The first statement says that being a dog is a sufficient condition for being an animal, and the second that being an animal is a necessary condition for being a dog. However, a little reflection

reveals that these two statements say exactly the same thing. Thus, each expresses in one way a necessary condition and in another way a sufficient condition.

Note:	***A is a sufficient condition for B; if A occurs, then B must occur.*** ***A is a necessary condition for B; if B occur, then A must occur.***

In general, non-argumentative passages may contain components that resemble the premises and conclusions of arguments, but they do not have an inferential claim. However, some passages like expository passages, illustrations, and explanations can be interpreted as arguments; and the inferential contents of conditional statements may be re-expressed to form arguments. Therefore, in deciding whether a passage contains an argument, you should look for three things:

1) *indicator words such as "therefore," "since," "because," and so on;*
2) *an inferential relationship between the statements; and*
3) *typical kinds of non-arguments.*

But remember that the mere occurrence of an indicator word does not guarantee the presence of an argument. You must check to see that the statement identified as the conclusion is claimed to be supported by one or more of the other statements. Also keep in mind that in many arguments that lack indicator words, the conclusion is the first statement. Furthermore, it helps to mentally insert the word "therefore" before the various statements before deciding that a statement should be interpreted as a conclusion.

Lesson 3: Types of Arguments: Deduction and Induction

Lesson Overview

In our previous lesson, we saw that every argument involves an inferential claim- the claim that the conclusion is supposed to follow from the premises. Every argument makes a claim that its premises provide grounds for the truth of its conclusion. The question we now address has to do with the strength of this claim. Just how strongly is the conclusion claimed to follow from the premises. The reasoning process (inference) that an argument involves is expressed either with

certainty or with probability. That is what the logician introduced the name *deduction* and *induction* for, respectively. If the conclusion is claimed to follow with strict certainty or necessity, the argument is said to be deductive; but if it is claimed to follow only probably, the argument is said to be inductive. Therefore, a conclusion may be supported by its premise in two very different ways. These two different ways are the two great classes of arguments: *Deductive arguments* and *Inductive arguments*. And the distinction between these two classes of arguments, because every argument involves an inferential claim, lies in the strength of their inferential claim. Understanding the distinction of these classes is essential in the study of logic.

In this lesson, we will learn the broad groups of arguments, Deductive arguments and Inductive arguments, and the techniques of distinguishing one from the other.

Lesson Objectives:

After the successful accomplishment of this lesson, you will be able to:

- Understand the meaning, nature, and forms of a deductive argument.
- Understand the meaning, nature, and forms of an inductive argument.
- Distinguish deductive arguments from inductive arguments, and vice versa.

3.1 Deductive Arguments

Activity # 1: - *Dear learners, how do you define a deductive argument?*

A ***deductive argument*** is an argument incorporating the claim that it is impossible for the conclusion to be false given that the premises are true. It is an argument in which the premises are claimed to support the conclusion in such a way that it is impossible for the premises to be true and the conclusion false. In such arguments, the conclusion is claimed to follow necessarily (conclusively) from the premises. Thus, deductive arguments are those that involve necessary reasoning.

Example-1: *All philosophers are critical thinkers.*

Socrates is a philosopher.

Therefore, Socrates is a critical thinker.

Example-2:

All African footballers are blacks.
Messi is an African footballer.
It follows that, Messi is black.

The above two examples are examples of a deductive argument. In both of them, the conclusion is claimed to follow from the premises with certainty; or the premises are claimed to support their corresponding conclusion with a strict necessity. If we, for example, assume that all philosophers are critical thinkers and that Socrates is a philosopher, then it is impossible that Socrates not be a critical thinker. Similarly, if we assume that all African footballers are blacks and that Messi is an African footballer, then it is impossible that Messi not be a black. Thus, we should interpret these arguments as deductive.

3.2 Inductive Arguments

Activity # 2: - *Dear learners, how do you define an inductive argument?*

An ***inductive argument*** is an argument incorporating the claim that it is improbable for the conclusion to be false given that the premises are true. . It is an argument in which the premises are claimed to support the conclusion in such a way that it is improbable for the premises to be true and the conclusion false. In such arguments, the conclusion is claimed to follow only probably from the premises. The premises may provide some considerable evidence for the conclusion but they do not imply (necessarily support) the conclusion. In this case, we might have sufficient condition (evidence) but we cannot be certain about the truth of the conclusion. However, this does not mean that the conclusion is wrong or unacceptable, where as it could be correct or acceptable but only based on probability. Thus, inductive arguments are those that involve probabilistic reasoning.

Example-1:

Most African leaders are blacks.
Mandela was an African leader.
Therefore, probably Mandela was black.

Example-2:

Almost all women are mammals.
Hanan is a woman.
Hence, Hanan is a mammal.

Both of the above arguments are inductive. In both of them, the conclusion does not follow from the premises with strict necessity, but it does follow with some degree of probability. That is, the conclusion is claimed to follow from the premises only probably; or the premises are claimed to support their corresponding conclusion with a probability. In other words, if we assume that the premises are true, then based on that assumption it is probable that the conclusion is true. If we, for example, assume that most African leaders were blacks and that Mandela was an African leader, then it is improbable that Mandela not been a black, or it is probable that Mandela was black. But it is not impossible that Mandela not been a black. Similarly, if we assume that almost all women are mammals and that Hanan is a woman, then it is improbable that Hanan not be a mammal, or it is probable that Hanan is a mammal. But it is not impossible that Hanan not be a mammal. Thus, the above arguments are best interpreted as inductive.

3.3 Differentiating Deductive and Inductive Arguments

Activity # 3: - *Dear learners, how do you distinguish a deductive argument from an inductive argument, and vice versa?*

Dear learners, we have said earlier that the distinction between inductive and deductive arguments lies in the strength of an argument's inferential claim. In other words, the distinction lies on how strongly the conclusion is claimed to follow from the premises, or how strongly the premises are claimed to support the conclusion. However, in most arguments, the strength of this claim is not explicitly stated, so we must use our interpretative abilities to evaluate it. In the deciding whether an argument is deductive or inductive, we must look at certain objective features of the argument.

There are three factors that influence the decision about the deductiveness or inductiveness of an argument's inferential claim. These are:

1) *The occurrence of special indicator words,*
2) *The actual strength of the inferential link between premises and conclusion, and*
3) *The character or form of argumentation the arguers use.*

However, we must acknowledge at the outset that many arguments in ordinary language are incomplete, and because of this, deciding whether the argument should best be interpreted as

deductive or inductive may be impossible. Let us see the above factors in detail in order to understand and identify the different styles of argumentation.

The first factor that influences our decision about a certain inferential claim is ***the occurrence of special indicator words***. There are different sort of indicator words that indicate or mark the type of a certain argument. Arguments may contain some words that indicate the arguer's certainty and confidence, or the arguer's uncertainty or doubt, about the truth of his/her conclusion. Words like "certainly,'' "necessarily," ''absolutely,'' and ''definitely'' indicate that the argument should be taken as deductive, whereas words like, "probable" ''improbable,'' ''plausible,'' ''implausible,'' ''likely,'' ''unlikely,'' and ''reasonable to conclude" suggest that an argument is inductive. The point is that if an argument draws its conclusion, using either of the deductive indicator words, it is usually best to interpret it as deductive, but if it draws its conclusion, using either of the inductive indicator words, it is usually best to interpret it as inductive. (Note that the phrase ''it must be the case that'' is ambiguous; ''must'' can indicate either probability or necessity).

Deductive and Inductive indicator words often suggest the correct interpretation. However, one should be cautious about these special indicator words, because if they conflict with one of the other criteria, we should probably ignore them. For arguers often use phrases such as ''it certainly follows that'' for rhetorical purposes to add impact to their conclusion and not to suggest that the argument be taken as deductive. Similarly, some arguers, not knowing the distinction between inductive and deductive, will claim to ''deduce'' a conclusion when their argument is more correctly interpreted as inductive. If one takes these words at face value, then one might wrongly leads into wrong conclusions. Therefore, the occurrence of an indicator word is not a certain guarantee for the deductiveness or inductiveness of an argument unless it is supported by the other features. This leads us to consider the second factor.

The second factor that bears upon our interpretation of an argument as inductive or deductive is ***the actual strength of the inferential link between premises and conclusion***. If the conclusion actually does follow with strict necessity from the premises, the argument is clearly deductive. In such an argument, it is impossible for the premises to be true and the conclusion false. If, on the other hand, the conclusion of an argument does not follow with strict necessity but does follow probably, it is usually best to interpret it as inductive argument. Consider the following examples.

Example-1:

All Ethiopian people love their country.
Debebe is an Ethiopian.
Therefore, Debebe loves his country.

Example-2:

The majority of Ethiopian people are poor.
Alamudin is an Ethiopian.
Therefore, Alamudin is poor.

In the first example, the conclusion follows with strict necessity from the premises. If we assume that all Ethiopian people love their country and that Debebe is an Ethiopian, then it is impossible that Debebe not love his country. Thus, we should interpret this argument as deductive. In the second example, the conclusion does not follow from the premises with strict necessity, but it does follow with some degree of probability. If we assume that the premises are true, then based on that assumption it is probable that the conclusion is true. Thus, it is best to interpret the second argument as inductive.

Occasionally, an argument contains no special indicator words, and the conclusion does not follow either necessarily or probably from the premises; in other words, it does not follow at all. This situation points up the need for the third factor to be taken into account, which is ***the character or form of argumentation*** the arguer uses. Let us see some examples of deductive argumentative forms and inductive argumentative forms.

Instances of Deductive Argumentative Forms

Many arguments have a distinctive character or form that indicates that the premises are supposed to provide absolute support for the conclusion. Five examples of such forms or kinds of argumentation are arguments based on mathematics, arguments from definition, and syllogisms: categorical, hypothetical, and disjunctive syllogisms.

Argument based on mathematics: it is an argument in which the conclusions depend on some purely arithmetic or geometric computation or measurement. For example, you can put two orange and three bananas in a bag and conclude that the bag contains five fruits. Or again you can measure a square pieces of land and after determining it is ten meter on each side conclude that its area is a hundred square meter. Since all arguments in pure mathematics are deductive, we can usually

consider arguments that depend on mathematics to be deductive as well. A noteworthy exception, however, is arguments that depend on statistics are usually best interpreted as inductive.

Arguments based on definition: it is an argument in which the conclusion is claimed to depend merely up on the definition of some words or phrase used in the premise or conclusion. For example, one may argue that Angel is honest; it is follows that Angel tells the truth. Or again, Kebede is a physician; therefore, he is a doctor. These arguments are deductive because their conclusions follow with necessity from the definitions "honest" and "physician".

Syllogisms are arguments consisting of exactly two premises and one conclusion. Syllogisms can be categorized into three groups; categorical, hypothetical, and disjunctive syllogism.

Categorical syllogism: a syllogism is an argument consisting of exactly two premises and one conclusion. Categorical syllogism is a syllogism in which the statement begins with one of the words "all", "no" and "some".

Example:

All Egyptians are Muslims.
No Muslim is a Christian.
Hence, no Egyptian is a Christian.

Arguments such as these are nearly interpreted as deductive.

***Hypothetical syllogism*:** It is a syllogism having a conditional statement for one or both of its premises.

Example:

If you study hard, then you will graduate with Distinction.
If you graduate with Distinction, then you will get a rewarding job.
Therefore, if you study hard, then you will get a rewarding job.

Such arguments are best interpreted as deductive.

Disjunctive syllogism: it is a syllogism having a disjunctive statement. (I.e. an "either … or" statement.)

Example:

Rewina is either Ethiopian or Eritrean.
Rewina is not Eritrean.
Therefore, Rewina is Ethiopian.

As with hypothetical syllogism, such arguments are usually best taken as deductive.

Instances of Inductive Argumentative Forms

In general, inductive arguments are such that the content of the conclusion is in some way intended to "go beyond" the content of the premises. The premises of such an argument typically deal with some subject that is relatively familiar, and the conclusion then moves beyond this to a subject that is less familiar or that little is known about. Such an argument may take any of several forms: predictions about the future, arguments from analogy, inductive generalizations, arguments from authority, arguments based on signs, and causal inferences, to name just a few.

Prediction: in a prediction the premises deals with some known event in the present or the past and the conclusions moves beyond this event to some event to relative future. For example, one may argue that because certain clouds develop in the center of the highland, a rain will fall within twenty-four hours. Nearly everyone realizes that the future cannot be known with certainty. Thus, whenever an argument makes a prediction about the future one is usually justified considering the argument inductive.

An argument from analogy: It is an argument that depends on the existence of an analogy or similarity between two things or state of affairs. Because of the existence of this analogy a certain conditions that affects the better- known thing or situations is concluded to affect the less familiar , lesser known-thing or situation. For instance, one may conclude, after observing the similarity of some features of Computer A and car B: that both are manufactured in 2012; that both are easy to access; that Computer A is fast in processing; it follows that Computer B is also fast in processing.

This argument depends on the existence of a similarity or analogy between the two cars. The certitude attending such an inference is obviously probabilistic at best.

An inductive generalization: it is an argument that proceeds from the knowledge of a selected sample to some claim about the whole group. Because the members of the sample have a certain characteristics, it is argued that all members of the group have the same characteristics. For example, one may argue that because three out of four people in a single prison are black, one may conclude that three-fourth of prison populations are blacks. This example illustrate the use of statistics in inductive argumentation.

An argument from authority: it is an argument in which the conclusions rest upon a statement made by some presumed authority or witness. A lawyer, for instance, may argue that the person is guilty because an eyewitness testifies to that effect under oath. Or again one may argue that all matters are made up of a small particles called "quarks" because the University Professor said so. Because the professor and the eyewitness could be either mistaken or lying, such arguments are essentially probabilistic.

Arguments based on sign: it is an argument that proceeds from the knowledge of a certain sign to the knowledge of a thing or situation that the sign symbolizes. For instance, one may infer that after observing 'No Parking' sign posted on the side of a road, the area is not allowed for parking. But because the sign might be displaced or in error about the area or forgotten, conclusion follows only probably.

***A causal inference*:** it is an argument which proceed from the knowledge of a cause to the knowledge of an effect, or conversely, from the knowledge of an effect to knowledge of a cause. For example, from the knowledge that a bottle of water had been accidentally left in the freezer overnight, someone might conclude that it had frozen (cause to effect). Conversely, after tasting a piece of chicken and finding it dry and tough, one might conclude that it had been overcooked (effect to cause). Because specific instances of cause and effect can never be known with absolute certainty, one may usually interpret such an argument as inductive.

Furthermore Considerations

It should be noted that the various subspecies of inductive arguments listed here are not intended to be mutually exclusive. Overlaps can and do occur. For example, many causal inferences that proceed from cause to effect also qualify as predictions. We should take care not to confuse arguments in geometry, which are always deductive, with arguments from analogy or inductive generalizations. For example, an argument concluding that a triangle has a certain attribute (such as a right angle) because another triangle, with which it is congruent, also has that attribute might be mistaken for an argument from analogy.

One broad classification of arguments not listed in this survey is *scientific arguments*. Arguments that occur in science can be either inductive or deductive, depending on the circumstances. In general, arguments aimed at the discovery of a law of nature are usually considered inductive.

Another type of argument that occurs in science has to do with the application of known laws to specific circumstances. Arguments of this sort are often considered to be deductive, but only with certain reservations.

A final point needs to be made about the distinction between inductive and deductive arguments. There is a tradition extending back to the time of Aristotle that holds that inductive arguments are those that proceed from the particular to the general, while deductive arguments are those that proceed from the general to the particular. (A particular statement is one that makes a claim about one or more particular members of a class, while a general statement makes a claim about all the members of a class.) In fact, there are deductive arguments that proceed from the general to the general, from the particular to the particular, and from the particular to the general, as well as from the general to the particular; and there are inductive arguments that do the same. For example, here is a deductive argument that proceeds from the particular to the general:

Three is a prime number.
Five is a prime number.
Seven is a prime number.
Therefore, all odd numbers between two and eight are prime numbers.

Here is an inductive argument that proceeds from the general to the particular:

All emeralds previously found have been green.
Therefore, the next emerald to be found will be green.

In sum up, to distinguish deductive arguments from inductive, we look for special indicator words, the actual strength of the inferential link between premises and conclusion, and the character or form of argumentation.

Lesson 4: Evaluating Arguments

Lesson Overview

In our previous lesson, we have seen that every argument makes two basic claims: a claim that evidence or reasons exist and a claim that the alleged evidence or reasons support something (or that something follows from the alleged evidence or reasons). The first is a factual claim, and the second is an inferential claim. The evaluation of every argument centers on the evaluation of these two claims. The most important of the two is the inferential claim, because if the premises fail to support the conclusion (that is, if the reasoning is bad), an argument is worthless. Thus, we will always test the inferential claim first, and only if the premises do support the conclusion will we test the factual claim (that is, the claim that the premises present genuine evidence, or are true). In this lesson, we will be introduced with the central ideas and terminologies required to evaluate arguments. And the primary purpose of this lesson is to introduce you with the natures of good arguments both in deductive and inductive arguments. Hence, you will learn effective techniques and strategies for evaluating arguments.

Lesson Objectives:

After the successful accomplishment of this lesson, you will be able to:

- Understand how to evaluate deductive arguments in terms of validity and soundness.
- Recognize the relationship between truth value and validity.
- Understand how to evaluate inductive arguments in terms of strength and cogency.
- Recognize the relationship between truth value and strength.

4.1 Evaluating Deductive Arguments: Validity, Truth, and Soundness

Activity # 1: - *Dear learners, how do you think are validity and soundness? How do you think are the validity and soundness of a deductive argument evaluated?*

Deduction and Validity

The previous section defined a deductive argument as one in which the premises are claimed to support the conclusion in such a way that if they are assumed true, it is impossible for the conclusions to be false. If the premises do in fact support the conclusions in this way the arguments is said to be *valid*; if not, it is *invalid*. Thus, a ***valid deductive argument*** is an argument such that if the premises are assumed true, it is impossible for the conclusion to be false. In such arguments, the conclusion follows with strict necessity from the premises. Conversely, an ***invalid deductive argument*** is an argument such that if the premises are assumed true, it is possible for the conclusion to be false. In these arguments, the conclusion does not follow with strict necessity from the premises, even though it is claimed to. Consider the following examples:

Example-1:

All men are mammals.
All bulls are men.
Therefore, all bulls are mammals.

Example-2:

All philosophers are rational.
Socrates was rational.
Therefore, Socrates was a philosopher.

The first example is valid argument, because the conclusion actually followed from the premises with a strict necessity. If all men are assumed as mammals and bulls as men, then it is impossible for bulls not be mammals. Hence, the argument is valid. The second example is invalid argument, because the conclusion did not actually follow from the premises with a strict necessity, even though it is claimed to. That is, even if we assume that all philosophers rational and Socrates is rational, it is not actually impossible for Socrates not be a philosopher.

The above definitions of valid and invalid arguments, along with their corresponding examples, lead us into two immediate conclusions. The first is that there is no middle ground between valid and invalid. An argument is either valid or invalid. The second consequence is that there is only

an indirect relation between validity and truth. For an argument to be valid it is not necessary that either the premises or the conclusions be true, but merely that if the premises assumed true, it is impossible for the conclusion be false. That is, we do not have to know whether the premise of an argument is actually true in order to determine its validity (valid or invalid). To test an argument for validity, we begin by assuming that all premises are true, and then we determine if it is possible, in light of that assumption, for the conclusion to be false. Thus, the validity of argument is the connection between premise and conclusion rather than on the actual truth or falsity of the statement formed the argument.

There are ***four possibilities*** with respect to the truth or falsity of the premises and conclusion of a given argument:

1) *True premises and True conclusion,*
2) *True premises and False conclusion,*
3) *False premises and True conclusion, and*
4) *False premises and False conclusion.*

Note that all of the above possibilities, except the second case (true premises and false conclusion), allow for both valid and invalid arguments. That is, the second case does not allow for valid arguments. As we have just seen, any argument having this combination is necessarily invalid. Let us discuss these possibilities in detail with examples.

Validity and Truth Value

Possibility # 1: A combination of *True premises and True conclusion* (the first case) allows for both valid and invalid arguments. Consider the following examples:

Example-1 (Valid):

All women are mammals. (Tp)
My mother is a mammal. (Tp)
Therefore, my mother is a woman. (Tc)

Example-2 (Invalid):

All philosophers are critical thinkers. (Tp)
Plato was a critical thinker. (Tp)
Therefore, Plato was a philosopher. (Tc)

Based on the features of valid and invalid arguments, the above two examples, each of which combine *True premises and True conclusion*, are valid argument and invalid argument, respectively. Therefore, the first combination allows for both valid and invalid arguments.

Possibility # 2: A combination of *True premises and false conclusion* (the second case) allows only for invalid arguments. Consider the following example:

Example-1 (Invalid):

All biologists are scientists. (Tp)
John Nash was a scientist. (Tp)
Therefore, John Nash was a biologist. (Fc)

Based on the features of validity, the above example, which combines *True premises and False conclusion*, is an invalid argument. A valid argument with such combination does not exist. Any deductive argument having actually true premises and an actually false conclusion is invalid, because if the premises are actually true and the conclusion is actually false, then it certainly is possible for the premises to be true and the conclusion false. Thus, by definition, the argument is invalid. After all such combinations are contrary to the inferential claim of a deductive argument: if the premises are assumed to be true, then it is impossible for the conclusion to be false. Therefore, the second combination allows only for invalid arguments.

Possibility # 3: A combination of *False premises and True conclusion* (the third case) allows for both valid and invalid arguments. Consider the following examples:

Example-1 (Valid):

All birds are mammals. (Fp)
All women are birds. (Fp)
Therefore, all women are mammals. (Tc)

Example-2 (Invalid):

All birds are mammals. (Fp)
All ostriches are mammals. (Fp)
Therefore, all ostriches are birds. (Tc)

Based on the features of valid and invalid arguments, the above two examples, each of which combine *False premises and True conclusion*, are valid argument and invalid argument,

respectively. Therefore, the third combination, as the first one, allows for both valid and invalid arguments.

Possibility # 4: A combination of *False premises and False conclusion* (the fourth case) allows for both valid and invalid arguments. Consider the following examples:

Example-1 (Valid):	**Example-2 (Invalid):**
All Americans are Ethiopians. (Fp)	*All birds are mammals. (Fp)*
All Egyptians are Americans. (Fp)	*All ants are mammals. (Fp)*
Thus, all Egyptians are Ethiopians. (Fc)	*Therefore, all ants are birds. (Fc)*

Based on the features of valid and invalid arguments, the above two examples, each of which combine *False premises and False conclusion*, are valid argument and invalid argument, respectively. Therefore, the fourth combination also allows for both valid and invalid arguments.

In general, the basic idea of evaluating deductive argument, validity (valid and invalid) is not something that is determined by the actual truth or falsity of the premises and conclusion. Rather, validity is something that is determined by the relationship between premises and conclusion. The question is not whether premises and conclusion are true or false, but whether the premises support the conclusion. Nevertheless, there is one arrangement of truth and falsity in the premises and conclusion that does determine the issue of validity. Any deductive argument having actually true premises and an actually false conclusion is invalid for the reason given above. The idea that any deductive argument having actually true premises and a false conclusion is invalid may be the most important point in the entire system of deductive logic. The entire system of deductive logic would be quite useless if it accepted as valid any inferential process by which a person could start with truth in the premises and arrive at falsity in the conclusion.

The relationship between the validity of a deductive argument and the truth and falsity of its premises and conclusions summarized as follows.

Table 1.1

Premises	***Conclusion***	***Validity***
True	*True*	*Valid/invalid*
True	*False*	*Invalid*
False	*True*	*Valid/invalid*
False	*False*	*Valid/invalid*

Deduction and Soundness

We said earlier that the evaluation of every argument centers on the evaluation of two claims: the inferential claim and factual claim of the argument. We have also said that we will always test the inferential claim first, and only if the premises do support the conclusion will we test the factual claim (that is, the claim that the premises present genuine evidence, or are true). Now that we have tested the inferential claims of deductive arguments, it is time to proceed to the next step: evaluating the factual claims of deductive arguments.

Depending on their actual ability, (assuming that they already have actually accomplished their inferential claims by being valid), to accomplish their factual claims, deductive arguments can be either *sound* or *unsound*. A ***sound argument*** is a deductive argument that is *valid* and has *all true premises.* Both conditions must be met for an argument to be sound, and if either is missing the argument is unsound. A deductive argument that does not actually accomplish its inferential claim, (that is not valid), cannot be sound, regardless of the truth values of its premises. Such a deductive argument is unsound, by definition. Thus, an ***unsound argument*** is a deductive argument that is either valid with one or more false premises, or invalid, or both. Because a valid argument is one such that it is impossible for the premises to be true and the conclusion false, and because a sound argument does in fact have true premises, it follows that every sound argument, by definition, will have a true conclusion as well. A sound argument, therefore, is what is meant by a ‘‘good’’ deductive argument in the fullest sense of the term.

Sound Argument = A valid argument + All true premises
Sound Argument = A valid argument + All true premises

4.2 Evaluating Inductive Arguments: Strength, Truth, and Cogency

Activity # 2: - *Dear learners, how do you think are strength and cogency? How do you think are the strength and cogency of an inductive argument evaluated?*

Induction and Strength

The previous section defined an inductive argument as one in which the premises are claimed to support the conclusions in such a way that if they are assumed true, it is improbable for the conclusions to be false. If the premises do in fact support the conclusions in this way the arguments is said to be *strong*; if not, it is *weak*. Thus, a ***strong inductive argument*** is an argument such that if the premises are assumed true, it is improbable for the conclusion to be false. In such arguments, the conclusion follows probably from the premises. Conversely, a ***weak inductive argument*** is an argument such that if the premises are assumed true, it is probable for the conclusions to be false. In these arguments, the conclusion does not follow probably from the premises, even though it is claimed to. Consider the following examples:

Example-1:

This barrel contains one hundred apples.
Eighty apples selected at random were found tasty.
Therefore, probably all one hundred apples are tasty.

Example-2:

This barrel contains one hundred apples.
Three apples selected at random were found tasty.
Therefore, probably all one hundred apples are tasty.

The first example is strong argument, because the conclusion actually follows probably from the premises. The second example is weak argument, because the conclusion does not actually follow probably from the premises, even though it is claimed to. The procedure for testing the strength of inductive arguments runs parallel to the procedure for deduction.

Strength and Truth Value

Just as what happened from definitions and examples of valid and invalid arguments earlier, two immediate conclusions follow from the above definitions and examples of strong and weak arguments. The first is that, unlike the validity and invalidity of deductive arguments, the strength and weakness of inductive arguments admit certain form of degrees. To be considered strong, an inductive argument must have a conclusion that is more probable than improbable. In inductive arguments, there is no absolutely strong nor absolutely weak argument. For instance, the first is not absolutely weak nor the second absolutely strong. Both arguments would be strengthened or weakened by the random selection of a larger or smaller sample. The incorporation of additional premises into inductive arguments will also generally tend to strength or weaken it. For example, if the premise "one un-tasty apple that had been found earlier was removed" were added to the second argument, the argument would presumably be weakened.

The second consequence is that, as validity and invalidity, strength and weakness are only indirectly related to the truth values of their premises. The central question in determining strength or weakness is whether the conclusion would probably true if the premises are assumed true. For an argument to be strong it is not necessary that either the premises or the conclusions be true, but merely that if the premises assumed true, it is improbable for the conclusion be false. That is, we do not have to know whether the premise of an argument is actually true in order to determine its strength (strong or weak). To test an argument for strength, what we need to do is to assume the premise true and then to see whether the conclusion follows more/less probably from the premise. Thus, the strength or weakness of an inductive argument results not from the actual truth or falsity of the premises and conclusion, but from the probabilistic support the premises give to the conclusion.

We have said earlier that there are ***four possibilities*** with respect to the truth or falsity of the premises and conclusion of a given argument: *True premises and True conclusion, True premises and False conclusion, False premises and True conclusion, and False premises and False conclusion.* These possibilities work in inductive arguments as well.

Note that all of the above possibilities, except the second case (true premises and false conclusion), allow for both strong and weak arguments. That is, the second case does not allow for strong arguments. As we have just seen, any argument having this combination is necessarily weak.

In general, the basic idea of evaluating inductive argument, strength is not something that is determined by the actual truth or falsity of the premises and conclusion, but by the relationship between premises and conclusion. Nevertheless, there is one arrangement of truth and falsity in the premises and conclusion that does determine the issue of strength. Thus, any inductive argument having actually true premises and an actually false conclusion is weak.

The relationship between the strength of an inductive argument and the truth and falsity of its premises and conclusions summarized as follows.

Table 1.2:

Premises	*Conclusion*	*Strength*
True	*True*	*Strong/Weak*
True	*False*	*Weak*
False	*True*	*Strong/Weak*
False	*False*	*Strong/Weak*

Induction and Cogency

We said earlier that the evaluation of every argument centers on the evaluation of two claims: the inferential claim and factual claim of the argument. We have also said that we will always test the inferential claim first, and only if the premises do support the conclusion will we test the factual claim (that is, the claim that the premises present genuine evidence, or are true). Now that we have tested the

inferential claims of inductive arguments, it is time to proceed to the next step: evaluating the factual claims of inductive arguments.

Depending on their actual ability, (assuming that they already have actually accomplished their inferential claims by being strong), to accomplish their factual claims, inductive arguments can be either *cogent* or *uncogent*. A ***cogent argument*** is an inductive argument that is *strong* and has *all true premises.* Both conditions must be met for an argument to be cogent, and if either is missing the argument is uncogent. An inductive argument that does not actually accomplish its inferential claim, (that is not strong), cannot be cogent, regardless of the truth values of its premises. Such an inductive argument is uncogent, by definition. Thus, an ***uncogent argument*** is an inductive argument that is either strong with one or more false premises, or weak, or both. Because the conclusion of a cogent argument is genuinely supported by true premises, it follows that the conclusion of every cogent argument is probably true. A cogent argument is the inductive analogue of a sound deductive argument and is what is meant by a ‘‘good’’ inductive argument without qualification.

Cogent Argument = A strong argument + All true premises

There is a difference, however, between sound and cogent arguments in regard to the true-premise requirement. In a sound argument, it is only necessary that the premises be true and nothing more. Given such premises and good reasoning, a true conclusion is guaranteed. In a cogent argument, on the other hand, the premises must not only be true, they must also not ignore some important piece of evidence that outweighs the given evidence and entails a quite different conclusion. That is, if the premises reflect all the important factors, then the argument is cogent; if not, then obviously the argument is not cogent. Thus, for cogency, the premises must not only be true but also not overlook some important factor that outweighs the given evidence and requires a different conclusion.

Chapter Summary

Logic is a science that evaluates arguments; and takes argumentation and reasoning as its primary subject of study. The primary aim of logic is to develop a system of methods and principles that

we may use as criteria for evaluating the arguments of others and as guides in constructing arguments of our own. The study of logic increases students' confidence to criticize the arguments of others and advance arguments of their own. An argument is a systematic combination of one or more than one premises and one and only conclusion. A premise is a statement, which is claimed to provide a logical support or evidence to a single another statement, called conclusion. Conclusion is a statement, which is claimed to logically drawn from the alleged evidence. An argument can be either good or bad argument, depending on the logical ability of its premise(s) to support its conclusion.

Not all passages, however, contain an argument. In deciding whether a passage contains an argument, you should look for three things: (1) *indicator words*: premise or conclusion indicator words; (2) *an inferential relationship between the premises and conclusion*; and (3) *typical kinds of non-arguments*. But remember that the mere occurrence of an indicator word does not guarantee the presence of an argument. You must check whether the statement identified as the conclusion is claimed to be supported by one or more of the other statements. It is also important to keep in mind that in many arguments that lack indicator words, the conclusion is the first statement. Furthermore, it helps to mentally insert the word "therefore" before the various statements before deciding that a statement should be interpreted as a conclusion.

Arguments are generally divided into two: *deductive arguments* and *inductive arguments*. A deductive argument is an argument in which the premises are claimed to support the conclusion in such a way that if they are assumed true, it is impossible for the conclusions to be false. An inductive argument is an argument in which the premises are claimed to support the conclusion in such a way that if they are assumed true, it is improbable for the conclusions to be false. To distinguish deductive arguments from inductive arguments, or vice versa, we look for: (1) *special indicator words*, (2) *the actual strength of the inferential link between premises and conclusion*, and (3) *the character or form of argumentation*. If the conclusion follows with strict necessity from the premises, the argument is always deductive; if not, it could be either deductive or inductive depending on the other factors.

To evaluate an argument's actual accomplishment of its inferential and factual claims, two separate questions need to be answered: *first*, do the premises support the conclusion? *Second*, are all the

premises true? To answer the first question, we begin by assuming the premises true. Then, for deductive arguments, we determine whether, in light of this assumption, it necessarily follows that the conclusion is true. If it does, the argument is valid; if not, it is invalid. For inductive arguments, we determine whether it probably follows that the conclusion is true. If it does, the argument is strong; if not, it is weak. Finally, if the argument is either valid or strong, we turn to the second question and determine whether the premises are actually true. If all the premises are true, the argument is sound (in the case of deduction) or cogent (in the case of induction). All invalid deductive arguments are unsound, and all weak inductive arguments are uncogent.

Self Check Exercise

1. Define the following terms: Logic, Argument, Premise, Conclusion.

_____

_____

2. Explain how we can distinguish argumentative passages from no-argumentative passages.

_____

_____

3. Explain the meaning and functions of inferential and factual claims.

_____

_____

4. Discuss briefly the similarities and differences between deductive and inductive arguments. Support your discussion with your own examples.

_____

_____

5. Explain how we can distinguish deductive arguments from inductive arguments, and vice versa.

_____

_____

6. Discuss briefly the similarities and differences between valid and invalid arguments, and sound and unsound arguments. Support your discussion with your own examples.

_____

_____

7. Discuss briefly the similarities and differences between strong and weak arguments, and cogent and uncogent arguments. Support your discussion with your own examples.

8. Discuss briefly the similarities and differences between sound and cogent arguments. Support your discussion with your own examples.

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CHAPTER THREE

LOGIC AND LANGUAGE

Chapter Overview

In the previous chapter, we have seen the methods of argument construction and the ways by which we can evaluate arguments. Any good argument must be presented by clear, accurate and understandable language. Correct reasoning can only be conveyed through language. The clarification and analysis of terms and statements is the objective of philosophy in general and logic in particular. In order to interpret, analyze, and evaluate arguments well, one must pay close attention to language. Many errors in logic stem from a careless or imprecise use of language, and many misunderstandings about the nature of language. Hence, logic requires proper use of terms and statements. Therefore, in this chapter we will study about the purposes of language, meaning and definitions of terms and different techniques of definitions of terms. We will see an overview of philosophy of language, the formal meaning of words, how to define our concepts, intention and extension of terms, types, purposes, and techniques of definition, the standard criteria of lexical definitions, and finally, we will discuss about how to use definition to evaluate arguments.

Chapter Objectives:

Dear learners, after the successful completion of this chapter, you will be able to:

- Recognize the relationship between logic and language.
- Identify the part of language important for logic.
- Identify the varieties of meaning of words.
- Appreciate the intensional and extensional meaning of terms.
- Recognize the types, purposes, and techniques of definitions.
- Appreciate the common rules for lexical definitions.
- Understand the purpose of using proper language in arguments.
- Comprehend how to use definitions to evaluate arguments.

Lesson 1: Philosophy of Language: An overview

Lesson Overview

Philosophy of Language is the reasoned inquiry into the origins of language, nature of meaning, the usage and cognition of language, and the relationship between language and reality. Language is a body of standard meanings of words and the form of speech used as a means of expressing the feeling, emotion, desire, thought etc in a consistent pattern of communication. In this lesson, we will see an overview of philosophy of language, particularly, the meaning and nature of philosophy of language, the history and philosophical debates of philosophy of language, and some major philosophical approaches to the nature of meaning.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Understand the meaning and nature of philosophy of language.
- Recognize the central philosophical debates about language.
- Identify some of the major philosophical approaches to the nature of meaning.

1.1 What is Philosophy of Language?

Activity # 1: *Dear learners, what do you think is philosophy of language*

One of the most fundamental questions asked in Philosophy of Language is "*what is language (in general terms)?"* According to semiotics, language is the mere manipulation and use of symbols in order to draw attention to signified content. Semiotics is the study of sign processes in communication and of how meaning is constructed and understood.

Philosophy of Language is the reasoned inquiry into the *origins of language, nature of meaning, the usage and cognition of language*, and *the relationship between language and reality*. It is an important discipline in its own right, and hence, it poses questions like "What is meaning?", "How does language refer to the real world?", "Is language learned or is it innate?", "How does the meaning of a sentence emerge out of its parts?, and other related issues.

Philosophy of language, however, should not be confused with Linguistics, because Linguistics is the field of study that asks questions like: What distinguishes one particular language from another e.g. what is it that makes "English" English? What is the difference between Spanish and French? Linguists, like Noam Chomsky, a figure who has come to define the 20th century linguistics, have emphasized the role of "grammar" and syntax (the rules that govern the structure of sentences) as a characteristic of any language. Chomsky believes that humans are born with an innate understanding of what he calls "universal grammar" (an innate set of linguistic principles shared by all humans) and a child's exposure to a particular language just triggers this antecedent knowledge. Chomsky begins with the study of people's internal language (what he calls "I-languages"), which are based upon certain rules which generate grammars, supported in part by the conviction that there is no clear, general and principled difference between one language and the next, and which may apply across the field of all languages. Other attempts, which he dubs "E-languages", have tried to explain a language as usage within a specific speech community with a specific set of well-formed utterances in mind.

Translation and interpretation present other problems to philosophers of language. The resulting view is called ***Semantic Holism***, a type of Holism which holds that meaning is not something that is associated with a single word or sentence, but can only be attributed to a whole language (if at all).

1.2 A Brief Note on the Debates and History of Philosophy of Language

In the Western tradition, the early work was covered, by Plato, Aristotle and the Stoics of Ancient Greece. Plato generally considered that the names of things are determined by nature, with each phoneme (the smallest structural unit that distinguishes meaning) representing basic ideas or sentiments, and that convention only has a small part to play. Aristotle held that the meaning of a predicate (the way a subject is modified or described in a sentence) is established through an abstraction of the similarities between various individual things (a theory later known as Nominalism). His assumption that these similarities are constituted by a real commonality of form, however, also makes him a proponent of moderate Realism.

The Stoic philosophers made important contributions to the analysis of grammar, distinguishing five parts of speech: nouns, verbs, appellatives, conjunctions and articles. What they called the lektón (the meaning, or sense, of every term) gave rise to the important concept of the proposition of a sentence (its ability to be considered an assertion, which can be either true or false). The Scholastics of the Medieval era were greatly interested in the subtleties of language and its usage, provoked to some extent by the necessity of translating Greek texts into Latin. They considered Logic to be a "science of language", and anticipated many of the most interesting problems of modern Philosophy of Language, including the phenomena of ***vagueness and ambiguity,*** the doctrines of proper and improper supposition (the interpretation of a term in a specific context), and the study of categorematic and syncategorematic words and terms. Linguists of the Renaissance period were particularly interested in the idea of a philosophical language (or universal language), spurred on by the gradual discovery in the West of Chinese characters and Egyptian hieroglyphs.

The philosophical study of language, finally, began to play a more central role in Western philosophy in the late 19thand 20th Centuries, especially philosophical branches of Analytic Philosophy and philosophy as a whole was understood to be purely a matter of Philosophy of Language.

To sum up, philosophy of language is the reasoned inquiry into the nature, origins, and usage of language. As a topic, the philosophy of language, particularly for analytic Philosophers, has been concerned with four central problems: the nature of meaning, language use, language cognition, and the relationship between language, logic and reality. For continental philosophers, however, the philosophy of language tends to be dealt with, not as a separate topic, but as a part of logic and other field of studies.

1.3 Some Philosophical Approaches to the Nature of Meaning

The question, "what is meaning?", is not immediately obvious. Most frequently, “Meaning" can be described as the content carried by the words or signs exchanged by people when communicating through language. Arguably, there are two essentially different types of linguistic meaning: ***conceptual meaning*** (which refers to the definitions of words themselves, and the

features of those definitions, which can be treated using semantic feature analysis) and ***associative meaning*** (which refers to the individual mental understandings of the speaker, and which may be ***connotative, collocative, social, affective, reflected or thematic****).*

There are several approaches to the philosophical nature of meaning. Among others, the following are the major ones:

1) ***Idea theories:*** these theories claim that meanings are purely mental contents provoked by signs. This approach is mainly associated with the British Empiricist traditions of John Locke, George Berkeley and David Hume, though some contemporary theorists have renewed it under the guise of semantic internalism.
2) ***Truth-conditional theories****:* these theories hold meaning to be the conditions under which an expression may be true or false. This tradition goes back to Gottlob Frege, although there has also been much modern work in this area.
3) ***Use theories***: these theories understand meaning to involve or be related to speech acts and particular utterances, not the expressions themselves. This approach was pioneered by Ludwig Wittgenstein and his Communitarian view of language.
4) ***Reference theories*** (or ***semantic externalism***): these theories view meaning to be equivalent to those things in the world that are actually connected to signs. Tyler Burge and Saul Kripke are the best known proponents of this approach.
5) **Verificationist theories**: these theories associate the meaning of a sentence with its method of verification or falsification. This Verificationist approach was adopted by the Logical Positivists of the early 20th century.
6) ***Pragmatist theories***: these theories maintain that the meaning or understanding of a sentence is determined by the consequences of its application?

Lesson 2: Logic and Meaning

Lesson Overview

Language is a body of standard meanings of words and the form of speech used as a means of expressing the feeling, emotion, desire, thought etc in a consistent pattern of communication. Language requires symbol such as words, sounds, gestures, signs that are patterned and related in a certain way for the purpose of communicating meanings. . We use language in many different ways. It is the tool of communication and the means of expressing ideas. It is the way of conveying information and evoking feelings In this lesson, we will learn the distinct functions of language, which are relevant for the study of logic, along with their corresponding meanings, and the intensional and extensional meaning of terms. recognize the functions of language and we will be acquainted with the two distinct uses of language which is relevant for the study of logic.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

Recognize the functions of language, which are relevant for the study of logic.

- Recognize the cognitive and Emotive meaning of words.
- Comprehend the role of emotive terminologies in statements and arguments.
- Identify the ways in cognitive meanings can be defective.
- Recognize the forms of disputes in logic.
- Understand the Intensional and Extensional meaning of terms.

2.1 The Functions of Language: Cognitive and Emotive Meanings

Activity # 1: *Dear learners, what functions of language do you know? How do you understand cognitive and emotive meanings of words?*

Dear learners, we have discussed, in the preceding chapter, that argument is a group of statements; and statements are sentences that are declarative. Sentences are made up of words; and words have

their own meanings that are to be conveyed through definitions. Therefore, words are the most basic units in any language, and thus the most important thing in every argument.

Ordinary language, as most of us are at least vaguely aware, serves various functions in our day-to-day lives. The twentieth-century philosopher Ludwig Wittgenstein thought the number of these functions to be virtually unlimited. Thus, among other things, language is used to:

Ask questions
Tell stories
Tell lies
Guess at answers
Form hypotheses
Launch verbal assaults
Tell jokes
Flirt with someone
Give directions
Sing songs
Issue commands
Greet someone and so on.

For our purpose, two linguistic functions are particularly important: (1) to convey information and (2) to express or evoke feelings. Consider, for example, the following Statements:

Examples:

"Death penalty, which is legal in thirty-six states, has been carried out most often in Georgia; however, since 1977 Texas holds the record for the greatest number of executions."

"Death penalty is a cruel and inhuman form of punishment in which hapless prisoners are dragged from their cells and summarily slaughtered only to satiate the bloodlust of a vengeful public."

The statement in Example 1 is intended primarily to convey information while the statement in Example 2 is intended, at least in part, to express or evoke feelings. These statements accomplish their respective functions through the distinct kinds of terminology in which they are phrased. Terminology that conveys information is said to have ***cognitive meaning***, and terminology that expresses or evokes feelings is said to have ***emotive meaning***. Thus, in Example 1 the words ''legal,'' ''thirty-six,'' ''most often,'' ''Georgia,'' ''record,'' etc. have primarily a cognitive meaning, while in Example 2 the words ''cruel,'' ''inhuman,'' ''hapless,'' ''dragged,'' ''slaughtered,'' ''bloodlust,'' and ''vengeful'' have a strong emotive meaning. Of course, these latter words have cognitive meaning as well. ''Cruel'' means tending to hurt others, ''inhuman'' means inappropriate for humans, ''hapless'' means unfortunate, and so on.

The emotively charged statement about the death penalty illustrates two important Points: **First,** statements of this sort usually have both cognitive meaning and emotive meaning. Therefore, since logic is concerned chiefly with cognitive meaning, it is important that we be able to distinguish and disengage the cognitive meaning of such statements from the emotive meaning. **Second,** part of the cognitive meaning of such statements is a ***value claim***. A *value claim* is a claim that something is good, bad, right, wrong, or better, worse, more important or less important than some other thing. For example, the statement about the death penalty asserts the value claim that the death penalty is wrong or immoral. Such value claims are often the most important part of the cognitive meaning of emotive statements. Thus, for the purposes of logic, it is important that we be able to disengage the value claims of emotively charged statements from the emotive meaning and treat these claims as separate statements.

These observations suggest the reason that people use emotive terminology as often as they do. Value claims as such normally require evidence to support them. For example, the claim that the death penalty is immoral cannot simply stand by itself. It cries out for reasons to support it. But when value claims are couched in emotive terminology, the emotive ‘‘clothing’’ tends to obscure the fact that a value claim is being made, and it simultaneously gives psychological momentum to that claim. As a result, readers and listeners are inclined to swallow the value claim whole without any evidence. Furthermore, the intellectual laziness of many speakers and writers, combined with their inability to supply supporting reasons for their value claims, reinforces the desirability of couching such claims in emotive terminology. Many people, for example, will refer to someone as ‘‘crazy,’’ ‘‘stupid,’’ or ‘‘weird’’ when they want to express the claim that what that person is doing is bad or wrong and when they are unable or unwilling to give reasons for this claim.

2.1.1 Emotive Terminologies in Arguments

Let us now consider emotive terminology as it occurs in arguments. In arguments, emotive terminology accomplishes basically the same function as emotive terminology in statements. It allows the arguer to make value claims about the subject matter of the argument without providing evidence, and it gives the argument a kind of steamroller quality by which it tends to crush potential counter arguments before the reader or listener has a chance to think of them. This steamroller quality also tends to paralyze the logical thought processes of readers or listeners so that they are

not able to see illogical arguments in their true light. These effects of emotive terminology can be avoided if the reader or listener will disengage the value claims and other cognitive meanings from the emotive meaning of the language and re-express them as distinct premises.

Example:

Now that we know that the rocks on the moon are similar to those in our backyard and that tadpoles can exist in a weightless environment, and now that we have put the rest of the world in order, can we concentrate on the problems here at home? Like what makes people hungry and why is unemployment so elusive?

The conclusion of this argument is that our government should take money that has been spent on the space program and on international police actions and redirect it to solving domestic problems. The author minimizes the importance of the space program by covertly suggesting that it amounts to nothing more than work on ordinary rocks and tadpoles (which, by themselves are relatively insignificant), and he exaggerates the scope of the international effort by covertly suggesting that it has solved every problem on earth but our own. Also, the phrase ‘‘put . . . in order’’ suggests that the international effort has been no more important than restoring order to a room in one’s house. We might rephrase the argument in emotively neutral language, making the implicit suggestions and value claims explicit, as follows:

P-1: *The space program has been confined to work on ordinary rocks and tadpoles.*
P-2: *Ordinary rocks and tadpoles are less important than domestic hunger and unemployment.*
P-3: *Our international efforts have restored order to every nation on earth but our own.*
P-4: *These efforts have been directed to problems that are less important than our own domestic problems.*
C: *Therefore, our government should redirect funds that have been spent on these projects to solving our own domestic problems.*

By restructuring the argument in this way, we can more easily evaluate the degree to which the premises support the conclusion. Inspection of the premises reveals that the first, third, and possibly fourth premises are false. Thus, the actual support provided by the premises is less than

what we might have first expected. If the argument were to be rephrased a second time so that the premises turned out true (for example, the first premise might read ‘‘*Part* of the space program has been devoted to research on ordinary rocks and tadpoles’’), the support given to the conclusion would still be weaker than the author intended.

2.1.2 Deficiency of Cognitive Meanings: Vagueness and Ambiguity

Now that we have distinguished emotive meaning from cognitive meaning, let us explore some of the ways that cognitive meanings can be defective. Two problems that affect our cognitive use of language are vagueness and ambiguity. A linguistic expression is said to be ***vague*** if there are borderline cases in which it is impossible to tell if the expression applies or does not apply. Vague expressions often allow for a continuous range of interpretations. The meaning is hazy, obscure, and imprecise. For example, words such as ‘‘love,’’ ‘‘happiness, “peace,’’ ‘‘excessive,’’ ‘‘fresh,’’ ‘‘rich,’’ ‘‘poor,’’ ‘‘normal,’’ ‘‘conservative,’’ and ‘‘polluted’’ are vague. We can rarely tell with any precision whether they apply to a given situation or not. How fresh does something have to be in order to be called fresh?

Vagueness can also affect entire statements. Such vagueness may arise not so much from the individual words as from the way in which the words are combined. For example, suppose someone were to say, ‘‘Today our job situation is more transparent.’’ First, what is the meaning of ‘‘job situation’’? Does it refer to finding a job, keeping a job, filling a job, completing a job, or bidding on a job? And what exactly does it mean for a job situation to be ‘‘transparent’’? Does it mean that the job is more easily perceived or comprehended? That the job is more easily completed? That we can anticipate our future job needs more clearly? Or what else? Not all cases of vagueness, however, are problematic. To describe an acquaintance as ‘‘tall’’ or ‘‘thin’’ often causes no trouble in ordinary conversation. Indeed, it may be overly burdensome to describe this person in more precise language. Trouble arises only when the language is not sufficiently precise for what the situation demands.

The other way in which cognitive meanings can be defective is ambiguity. An expression is said to be ***ambiguous*** when it can be interpreted as having more than one clearly distinct meaning in a given context. For example, words such as ‘‘light,’’ ‘‘proper,’’ ‘‘critical,’’ ‘‘stress,’’ ‘‘mad,’’

‘‘inflate,’’ ‘‘chest,’’ ‘‘bank,’’ ‘‘sound,’’ and ‘‘race’’ can be used ambiguously. Thus, if one were to describe a beer as a light pilsner, does this mean that the beer is light in color, light in calories, or light in taste? If one were to describe an action as proper, does this mean proper in a moral sense or proper in the sense of being socially acceptable? Or if one were to describe a person as critical, does this mean that the person is essential for a certain task or that the person tends to criticize others?

As is the case with vagueness, ambiguity can also affect entire statements. Such ambiguity often results from the way in which certain words are combined.

The difference between ambiguity and vagueness is that vague terminology allows for a relatively continuous range of interpretations, whereas ambiguous terminology allows for multiple discrete interpretations. In a vague expression there is a **blur** of meaning, whereas in an ambiguous expression there is a **mix-up** of otherwise clear meanings. However, there are many forms of expression that are ambiguous in one context and vague in another. For example, the word ‘‘slow’’ in one context could mean either mentally retarded or physically slow, but when the word refers to physical slowness, it could be vague. How slow is slow? Similar remarks apply to ‘‘light,’’ ‘‘fast,’’ and ‘‘rich.’’

The role of vagueness and ambiguity in arguments may be conveniently explored in the context of conflicting arguments between individuals. Such conflicts are called disputes. Now let us see the two kinds of disputes in logic.

2.1.3 Forms of Disputes in Logic: Verbal and Factual Disputes

In order to understand these disputes better, we need to consider the following examples:

Example-1:

Kassa: *Mrs. Zenebech abuses her children. And how do I know that? I saw her spank one of her kids the other day after the kid misbehaved.*

Jemal: *Don’t be silly. Kids need discipline, and by disciplining her children, Mrs. Zenebech is showing that she loves them.*

Here, the problem surrounds the vagueness of the words ‘‘abuse’’ and ‘‘discipline.’’ When does discipline become abuse? The line separating the two is hazy at best, but unless it is clarified, disputes of this sort will never be resolved.

Example-2:

Mullu: *I’m afraid that Dagim is guilty of cheating in the exam. Last night he confessed to me that he was sate closer to Tsedale, who is the most excellent student in our class, and takes almost all answers from her.*

Worku: *No, you couldn’t be more mistaken. In this country, no one is guilty until proven so in a court of law, and Dagim has not yet even been accused of anything.*

In this example, the dispute arises over the ambiguity of the word ‘‘guilty.’’ Mullu is using the word in the moral sense. Given that Dagim has admitted to cheating in the exam, it is very likely that he did indeed cheated in the exam and therefore is guilty of cheating in the exam in the moral sense of the term. Worku, on the other hand, is using the word in the legal sense. Because Dagim has not been convicted in a court of law, he is not legally guilty of anything.

Disputes that arise over the meaning of language are called ***verbal disputes*****.** These are disputes in which the apparent conflict is not genuine and can be resolved by coming to agreement about how some words or phrases is to be understood. But not all disputes are of this sort. Some disputes arise over a disagreement about facts, and these are called ***factual disputes***.

Example:

Debebe: *I know that Fisseha stole a computer from the old school house. Aberash told me that she saw Fisseha do it.*

Maru: *That’s ridiculous! Fisseha has never stolen anything in his life. Aberash hates Fisseha, and she is trying to pin the theft on him only to shield her criminal boyfriend.*

Here, the dispute centers on the factual issues of whether Aberash told the truth and whether Fisseha stole the computer. Disputes arisen because of the truth or falsity of claims are ***factual disputes***. In dealing with disputes, the first question is whether the dispute is factual, verbal, or

some combination of the two. If the dispute is verbal, then the second question to be answered is whether the dispute concerns ambiguity or vagueness.

2.2 The Intension and Extension of Terms

The main task of logic is the evaluation of arguments. However, as we saw in the previous section, there are countless arguments, in which this task leads to the observation. Such an observation usually indicates that the meaning of certain words in the argument is vague or ambiguous. Clearing up the problem often involves supplying a definition. Thus, the study of meaning and definition is closely related to the main task of logic. In this section, we will continue our inquiry into aspects of linguistic meaning, and the results of this inquiry will provide the basis for the theory of definition in the next lessons.

The basic units of any ordinary language are words. Our main concern in this chapter, however, is not with words in general but with terms. A ***term*** is any word or arrangement of words that may serve as the subject of a statement. Terms consist of proper names, common names, and descriptive phrases. Here are some examples:

Proper Names	**Common Names**	**Descriptive Phrases**
Abebe	*Animal*	*First Prime Minister of Ethiopia*
South Ethiopia	*Activity*	*Author of Oromay*
The Ethiopian Parliament	*Person*	*Those who study hard*
Girmaa Gamachuu	*House*	

Words that are not terms include verbs, non-substantive adjectives, adverbs, prepositions, conjunctions, and all non-syntactic arrangements of words. The following words or phrases are not terms; none can serve as the subject of a statement:

dictatorial	*above and beyond*	*craves*
runs quickly	*moreover*	*cabbages into again the forest*

At this point, it is important to distinguish ***the use of a word*** from ***the mention of a word***. Without this distinction any word can be imagined to serve as the subject of a statement and, therefore, to count as a term. The word ‘‘wherever,’’ for example, is not a term, but ‘‘wherever’’ (in quotes)

can serve as the subject of a statement, such as ‘‘‘Wherever’ is an eight-letter word.’’ But in this statement, it is not the word itself that is the subject but rather the quoted word. The word is said to be mentioned- not used. On the other hand, ‘‘wherever’’ is used in this statement: ‘‘I will follow you wherever you go.’’ In distinguishing terms from non-terms one must be sure that the word or group of words can be used as the subject of a statement.

Words are usually considered to be symbols, and the entities they symbolize are usually called ***meanings***. Terms, being made up of words, are also symbols, but the meanings they symbolize are of two kinds: intensional and extensional. The ***intensional meaning*** (which is otherwise known as ***intension*** or ***connotation***) consists of the qualities or attributes that the term connotes, and the ***extensional meaning*** (which is otherwise known as ***extension*** or ***denotation***) consists of the members of the class that the term denotes. For example, the intensional meaning of the term ‘‘cat’’ consists of the attributes of being furry, of having four legs, of moving in a certain way, of emitting certain sounds, and so on, while the extensional meaning consists of cats themselves- all the cats in the universe. The term connotes the attributes and denotes the cats. ‘‘Intension’’ and ‘‘extension’’ are roughly equivalent to the more modern terms ‘‘sense’’ and ‘‘reference,’’ respectively. Also, it should be noted that logic uses the terms ‘‘connotation’’ and ‘‘denotation’’ differently from the way they are used in grammar. In grammar, ‘‘connotation’’ refers to the subtle nuances of a word, whereas ‘‘denotation’’ refers to the word’s direct and specific meaning.

Because terms symbolize meanings to individual persons, it is inevitable for subjective elements to invade the notion of connotation. To a cat lover the term ‘‘cat’’, for example, might connote the attributes of being cuddly and adorable, while to someone who hates cats it might connote the attributes of being obnoxious and disgusting. To avoid this problem, logicians typically restrict the meaning of connotation to what is usually called the ***conventional connotation***. The conventional connotation of a term includes the attributes that the term commonly calls forth in the minds of competent speakers of the language. Under this interpretation, the connotation of a term remains more or less the same from person to person and from time to time.

The denotation of a term also typically remains the same from person to person, but it may change with the passage of time. The denotation of ‘‘currently living cat,’’ for example, is constantly fluctuating as some cats die and others are born. The denotation of the term ‘‘cat,’’ on the other

hand, is presumably constant because it denotes all cats, past, present, and future. Sometimes the denotation of a term can change radically with the passage of time. The terms ‘‘currently living dodo bird’’ and ‘‘current king of France,’’ for example, at one time denoted actually existing entities, but today all such entities have perished. Accordingly, these terms now have what is called ***empty extension***. They are said to denote the empty (or ‘‘null’’) class, the class that has no members. While these terms have empty extension, however, they do not have empty intension, for they connote a variety of intelligible attributes.

The fact that some terms have empty extension leads us to an important connection between extension and intension- that ***intension determines extension***. The intensional meaning of a term serves as the criterion for deciding what the extension consists of. Because we know the attributes connoted by the term ‘‘unicorn’’- a term with empty extension-,w for example, we know that the term has empty extension. That is, we know that there are no four-legged mammals having a single straight horn projecting from their forehead. Similarly, the intension of the word ‘‘cat’’ serves as the criterion for determining what is and what is not a member of the class of cats.

One kind of term that raises problems for the intension-determines-extension rule is proper names. For example, the name ‘‘Abebe’’ might not appear to have any intension, but it denotes the person who has this name. Although philosophers have disagreed about this, it would seem that proper names must have some kind of intension or we would not know what persons, if any, they denote. Thus, we solve the problem. One possible solution to this problem is that names are shorthand symbols for descriptions or bundles of descriptions. For example, ‘‘Abebe’’ could be shorthand for ‘‘the first year student of Civil Engineering department, since 2005 E.C.’’ or ‘‘the person who is a representative of this section.’’

Another possible solution to the problem of proper names is that the intension of proper names consists of the causal chain of events leading from the point at which the name is first assigned to the point at which a certain person learns about the name. Thus, the first link in such a chain might be the baptismal event at which the name ‘‘Abebe” is given to a certain infant, the second link would be the event in which a certain third party is informed of the first event, and so on. This entire chain of events extending through the linguistic community would then constitute the intension of ‘‘Abebe.’’ Thus, we conclude that for all terms, including proper names, intension

determines extension.

The distinction between intension and extension may be further illustrated by comparing the way in which these concepts can be used to give order to random sequences of terms. Terms may be put in the order of *increasing intension*, *increasing extension*, *decreasing intension*, and *decreasing extension*.

A series of terms is in the order of ***increasing intension*** when each term in the series (except the first) connotes more attributes than the one preceding it. In other words, each term in the series (except the first) is more specific than the one preceding it. (A term is specific to the degree that it connotes more attributes.) The order of ***decreasing intension*** is the reverse of that of increasing intension. A series of terms is in the order of ***increasing extension*** when each term in the series (except the first) denotes a class having more members than the class denoted by the term preceding it. In other words, the class size gets larger with each successive term. The order of ***decreasing extension*** is the reverse of that of increasing extension.

Let us see the following examples:

> ***Increasing intension****: animal, mammal, feline, tiger*
> ***Increasing extension****: tiger, feline, mammal, animal*
> ***Decreasing intension****: tiger, feline, mammal, animal*
> ***Decreasing extension****: animal, mammal, feline, tiger*

These examples illustrate a fact pertaining to most such series: The order of increasing intension is usually the same as that of decreasing extension. Conversely, the order of decreasing intension is usually the same as that of increasing extension.

There are, however, some exceptions. Consider the following series:

> *Unicorn; unicorn with blue eyes; unicorn with blue eyes and green horn; unicorn with blue eyes, green horn, and a weight of over 400 pounds*

Each term in this series has empty extension; so, while the series exhibits the order of increasing intension, it does not exhibit the order of decreasing extension.

Here is another, slightly different, example:

> *living human being; living human being with a genetic code; living human being with a genetic code and a brain; living human being with a genetic code, a brain, and a height of less than 100 feet*

In this series, none of the terms has empty extension, but each term has exactly the same extension as the others. Thus, while the intension increases with each successive term, once again the extension does not decrease.

Logic and Definition

Lesson 3: Meaning, Types, and Purposes of Definitions

Lesson Overview

We have started our previous lesson by stating that argument is a group of statements; and that statements are sentences that are declarative; and that sentences are made up of words; and words have their own meanings that are to be conveyed through definitions. That is, the meaning that words or terms have is explicated by definitions. Definition is a technical and structural organization of words and/or terms or phrases in explaining the meaning of a given term. Good definitions are very helpful in eliminating verbal disputes. In this lesson, we will learn the meaning, nature, and types of definitions.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Understand the meaning, components, nature and of definitions.
- Identify the major types of definitions.
- Appreciate the practical purposes of definitions.

3.1 The Meaning of Definition

Activity # 1: *Dear learners, how do you understand a definition?*

Dear learners, definition is a technical and structural organization of words and/or terms or phrases in explaining the meaning of a given term. For most logicians, definitions are intended exclusively to explicate the meaning of words. Hence, we may define *definition* as a group of words that assigns a meaning to some word or group of words. Accordingly, every definition consists of two parts: the *definiendum* and the *definiens*. The ***definiendum*** is the word or group of words that is supposed to be defined, and the ***definiens*** is the word or group of words that does the defining. For example, in the definition ‘‘‘Tiger’ means a large, striped, ferocious feline indigenous to the jungles of India and Asia,’’ the word ‘‘tiger’’ is the definiendum, and everything after the word ‘‘means’’ is the definiens. The definiens is not itself the meaning of the definiendum; rather, it is the group of words that symbolizes (or that is supposed to symbolize) the same meaning as the definiendum. Because we presumably know in advance what the definiens symbolizes, we are led, via the definition, to understand what the definiendum symbolizes. It is in this way that the definition ‘‘assigns’’ a meaning to its definiendum.

3.2 The Types and Purposes of Definitions

Activity # 2: *Dear learners, what do you think are practical purposes of definitions?*

There are various kinds of definitions that are actually used in our practical life. Based on the functions that they actually serve, definitions can be classified into five: *stipulative, lexical, précising, theoretical,* and *persuasive definitions*. Let us discuss them in detail

1) Stipulative Definitions

A stipulative definition assigns a meaning to a word for the first time. This may involve either coining a new word or giving a new meaning to an old word. The purpose of a stipulative definition is usually to replace a more complex expression with a simpler one.

The need for a stipulative definition is often occasioned by some new phenomenon or development. For example, the attempt, which has made a few years ago at a certain zoo to crossbreed tigers and lions, has been succeeded because of the genetic similarity of the two species- that offspring were produced from a male tiger and a female lion and from a male lion and a female tiger. When the offspring were born, it became appropriate to give them names. Of course, the names ‘‘offspring of male tiger and female lion’’ and ‘‘offspring of male lion and female tiger’’ could have been used, but these names were hardly convenient. Instead, the names ‘‘tigon’’ and ‘‘liger’’ were selected. Any two new words would have sufficed equally well for naming the offspring- ‘‘topar’’ and ‘‘largine’’, for example, but ‘‘tigon’’ and ‘‘liger’’ were considered more appropriate, for obvious reasons. Hence, ‘‘Tigon’’ was taken to mean the offspring of a male tiger and a female lion, and ‘‘liger’’ the offspring of a male lion and a female tiger. These assignments of meanings were accomplished through stipulative definitions.

Another use for stipulative definitions is to set up secret codes. For example, during World War II, ‘‘Tora, Tora, Tora’’ was the code name Admiral Yamamoto transmitted to the war office in Tokyo signaling that the Japanese fleet had not been spotted in the hours preceding the bombing of Pearl Harbor. More recently, ‘‘Operation Desert Storm’’ was the code name given to the military invasion of Iraq. Law enforcement organizations have adopted similar code names for sting operations against organized crime.

It is important to note that because a stipulative definition is a completely arbitrary assignment of a meaning to a word for the first time, there can be no such thing as a ‘‘true’’ or ‘‘false’’ stipulative definition. Furthermore, for the same reason, a stipulative definition cannot provide any new information about the subject matter of the definiendum. The fact that the word ‘‘tigon’’ was selected to replace ‘‘offspring of a male tiger and a female lion’’ tells us nothing new about the nature of the animal in question. One stipulative definition may, however, be more or less convenient or more or less appropriate than another.

Stipulative definitions are misused in verbal disputes when one person covertly uses a word in a peculiar way and then proceeds to assume that everyone else uses that word in the same way. Under these circumstances that person is said to be using the word “stipulatively”. In such cases the assumption that other persons use the word in the same way is rarely justified. It is important,

however, to be aware that insofar as people keep coming up with new creations, whether it be new food concoctions, new inventions, new modes of behavior, new kinds of apparel, new dances, or whatever, the demand for stipulative definitions will continue.

2) Lexical Definitions

This definition is used to report the meaning that a word already has in a language. Dictionary definitions are all instances of lexical definitions. Thus, in contrast with a stipulative definition, a lexical definition may be true or false depending on whether it does or does not report the way a word is actually used. Because words are frequently used in more than one way, lexical definitions have the further purpose of eliminating the ambiguity that would otherwise arise if one of these meanings were to be confused with another.

As we saw in the first section of this chapter, an expression is ambiguous when it can be interpreted as having two or more clearly distinct meanings in a given context. Words such as ‘‘light,’’ ‘‘mad,’’ and ‘‘bank’’ can be used ambiguously. Because a lexical definition lists the various meanings that a word can have, a person who consults such a definition is better prepared to avoid ambiguous constructions of his or her own and to detect those of others. Undetected ambiguity causes the most trouble. In many cases the problem lies not with the obvious differences in meaning that words such as ‘‘light’’ and ‘‘bank’’ may have but with the subtle shadings of meaning that are more likely to be confused with one another. For example, if a woman is described as ‘‘nice,’’ any number of things could be intended. She could be fastidious, refined, modest, pleasant, attractive, or even lewd. A good lexical definition will distinguish these various shadings and thereby guard against the possibility that two such meanings will be unconsciously jumbled together into one.

3) Précising Definitions

The purpose of a précising definition is to reduce the vagueness of a word. As we saw in the first section of this chapter, an expression is vague if there are borderline cases in which it is impossible to tell if the word applies or does not apply. Words such as ‘‘fresh,’’ ‘‘rich,’’ and ‘‘poor’’ are vague. Once the vagueness of such words is reduced by a précising definition, one can reach a decision as to the applicability of the word to a specific situation. For example, if legislation were

ever introduced to give direct financial assistance to the poor, a précising definition would have to be supplied specifying exactly who is poor and who is not. The definition ‘‘‘Poor’ means having an annual income of less than $4,000 and a net worth of less than $20,000’’ is an example of a précising definition.

Whenever words are taken from ordinary usage and used in a highly systematic context such as science, mathematics, medicine, or law, they must always be clarified by means of a précising definition. The terms ‘‘force,’’ ‘‘energy,’’ ‘‘acid,’’ ‘‘element,’’ ‘‘number,’’ ‘‘equality,’’ ‘‘contract,’’ and ‘‘agent’’ have all been given précising definitions by specific disciplines.

Sometimes the substance of a court trial may revolve around the precise usage of a term. A trial in California addressed the question of whether a man who had driven a bicycle while intoxicated violated the motor vehicle code. The question concerned whether, for these purposes, a bicycle could be considered a ‘‘vehicle.’’ The court decided in the affirmative, and the decision amounted to an incremental extension of an already existent précising definition of the word ‘‘vehicle.’’

Another example involves the practice of surgical transplantation of vital organs. Before a heart transplant can be conducted, the donor must be dead; otherwise, the surgeon will be accused of murder. If the donor is dead for too long, however, the success of the transplant will be imperiled. But exactly when is a person considered to be dead? Is it when the heart stops beating, when the person stops breathing, when rigor mortis sets in, or some other time? The question involves the meaning of the term ‘‘moment of death.’’ The courts have decided that ‘‘moment of death’’ should be taken to mean the moment the brain stops functioning, as measured by an electroencephalograph. This decision amounts to the acceptance of a précising definition for ‘‘moment of death.’’

A précising definition differs from a stipulative definition in that the latter involves a purely arbitrary assignment of meaning, whereas the assignment of meaning in a précising definition is not at all arbitrary. A great deal of care must be taken to ensure that the assignment of meaning in a précising definition is appropriate and legitimate for the context within which the term is to be employed.

4) Theoretical Definitions

A theoretical definition assigns a meaning to a word by suggesting a theory that gives a certain characterization to the entities that the term denotes. Such a definition provides a way of viewing or conceiving these entities that suggests deductive consequences, further investigation (experimental or otherwise), and whatever else would be entailed by the acceptance of a theory governing these entities. The definition of the term ‘‘heat’’ found in texts dealing with the kinetic theory of heat provides a good example: ‘‘‘heat’ means the energy associated with the random motion of the molecules of a substance.’’ This definition does more than merely assign a meaning to a word; it provides a way of conceiving the physical phenomenon that is heat. In so doing, it suggests the deductive consequence that as the molecules of a substance speed up the temperature of the substance increases. In addition, it suggests a number of experiments- experiments investigating the relationship between molecular velocity and the phenomena of radiation, gas pressure, molecular elasticity, and molecular configuration. In short, this definition of ‘‘heat’’ provides the impetus for an entire theory about heat.

However, not all theoretical definitions are associated with science. Many terms in philosophy, such as “substance”, “form”, “cause”, “change”, “idea”, “good”, “mind”, and “God” have been given theoretical definitions. In fact most of the major philosophers in history have given these terms their own peculiar theoretical definitions, and this fact accounts in part for the unique character of their respective philosophies. For example, Gottfried Wilhelm Leibniz’s definition of ‘‘substance’’ in terms of what he called ‘‘monads’’ laid the foundation for his metaphysical theory, and John Stuart Mill’s definition of ‘‘good’’ as the greatest happiness of the greatest number provided the underpinnings for his utilitarian theory of ethics.

Like stipulative definitions, theoretical definitions are neither true nor false, strictly speaking. The reason is that theoretical definitions function as proposals to see or interpret some phenomenon in a certain way. Since proposals have no truth value, neither do theoretical definitions. They may, however, be more or less interesting or more or less fruitful, depending on the deductive consequences they entail and on the outcome of the experiments they suggest.

5) *Persuasive Definitions*

The purpose of a persuasive definition is to engender a favorable or unfavorable attitude toward what is denoted by the definiendum. This purpose is accomplished by assigning an emotionally charged or value-laden meaning to a word while making it appears that the word really has (or ought to have) that meaning in the language in which it is used. Thus, persuasive definitions amount to a certain synthesis of stipulative, lexical, and, possibly, theoretical definitions backed by the rhetorical motive to engender a certain attitude. As a result of this synthesis, a persuasive definition masquerades as an honest assignment of meaning to a term while condemning or blessing with approval the subject matter of the definiendum. Let us see the following examples:

> *"Abortion'' means the ruthless murdering of innocent human beings. ''Abortion'' means a safe and established surgical procedure whereby a woman is relieved of an unwanted burden.*
>
> *Taxation'' means the procedure by means of which our commonwealth is preserved and sustained.*
>
> *''Taxation'' means the procedure used by bureaucrats to rip off the people who elected them.*

While persuasive definitions may, like lexical definitions, be evaluated as either true or false, the primary issue is neither truth nor falsity but the effectiveness of such definitions as instruments of persuasion. Giving their primary objective- i.e., influencing the attitudes of the reader/listener- persuasive definitions may be used with considerable effectiveness in political speeches and editorial columns.

Lesson 4: Techniques of Definition

Lesson Overview

In the previous lesson, we presented a survey of some of the kinds of definitions actually in use and the functions they are intended to serve. These techniques may be classified in terms of the two kinds of meaning, intensional and extensional. In this lesson, we will investigate some of the techniques used to produce these definitions.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Identify the major techniques of producing definitions.

4.1 The Extensional (Denotative) Definitional Techniques

Activity # 1: *Dear learners, how do you define extensional definition?*

An ***extensional definition*** is one that assigns a meaning to a term by indicating the members of the class that the definiendum denotes. There are at least three ways of indicating the members of a class: pointing to them (demonstrative or ostensive definitions), naming them individually (enumerative definitions), and naming them in groups (definitions by subclass).

1) Demonstrative (Ostensive) Definitions

Demonstrative (Ostensive) Definitions are probably the most primitive form of definition. All one need know to understand such a definition is the meaning of pointing. Such definitions may be either partial or complete, depending on whether all or only some of the members of the class denoted by the definiendum are pointed to.

Here are some examples:

"Chair'' means this and this and this- as you point to a number of chairs, one after the other.

"Washington Monument'' means that- as you point to it.

If you were attempting to teach a foreigner your own native language, and neither of you understood a word of each other's language, demonstrative definition would almost certainly be one of the methods you would use.

Demonstrative definitions are also the most limited. In addition to the limitations affecting all extensional definitions, there is the obvious limitation that the required objects be available for being pointed at. For example, if one wishes to define the word ''sun'' and it happens to be

nighttime, a demonstrative definition cannot be used.

Demonstrative definitions differ from the other kinds of definitions in that the definiens is constituted at least in part by a gesture- the gesture of pointing. Since the definiens in any definition is a group of words, however, a gesture, such as pointing, must count as a word. While this conclusion may appear strange at first, it is supported by the fact that the ‘‘words’’ in many sign languages consist exclusively of gestures.

2) *Enumerative Definitions*

Enumerative Definitions assign a meaning to a term by naming the members of the class the term denotes. Like demonstrative definitions, they may also be either partial or complete.

Example:

“Actor’’ means a person such as Abebe Balicha, Samsom Taddesse, or Mahder Assefa.

Complete enumerative definitions are usually more satisfying than partial ones because they identify the definiendum with greater assurance. However, relatively few classes can be completely enumerated.

3) *Definition by Subclass*

Definition by Subclass assigns a meaning to a term by naming subclasses of the class denoted by the term. Such a definition, too, may be either partial or complete, depending on whether the subclasses named, when taken together, include all the members of the class or only some of them. See the following examples, the first is partial, the second is complete:

‘‘Tree’’ means an oak, pine, elm, spruce, maple, and the like.

“Fictional work’’ means a poem, a play, a novel, or a short story.

As with definitions by enumeration, complete definitions by subclass are more satisfying than partial ones; but because relatively few terms denote classes that admit of a conveniently small number of subclasses, complete definitions by subclass are often difficult, if not impossible, to provide.

Extensional definitions are chiefly used as techniques for producing lexical and stipulative definitions. Lexical definitions are aimed at communicating how a word is actually used, and one of the ways of doing so is by identifying the members of the class that the word denotes. Dictionaries, for example, frequently include references to the individual members (enumerative definition), or to the subclasses of the class (definition by subclass) denoted by the word being defined; and sometimes to the picture of the object that word symbolizes (demonstrative).

The task of stipulative definitions may be accomplished by all three kinds of extensional definition. For example, a biologist engaged in naming and classifying types of fish might assign names to the specific varieties by pointing to their respective tanks (demonstrative definition), and then she might assign a class name to the whole group by referring to the names of the specific varieties (definition by subclass). And an organizer of a children's game might make the stipulation: ''John, Mary, and Billy will be called 'Buccaneers,' and Judy, George, and Nancy will be 'Pirates''' (enumerative definition).

Although it is conceivable that extensional definitions could also serve as techniques for theoretical and persuasive definitions (though this would be highly unusual), extensional definitions by themselves cannot properly serve as précising definitions, for the following reason. The function of a précising definition is to clarify a vague word, and vagueness is a problem affecting intensional meaning. Because the intension is imprecise, the extension is indefinite. To attempt to render the intension precise by exactly specifying the extension (as with an extensional definition) would be tantamount to having extension determine intension- which cannot be done.

The principle that intension determines extension, whereas the converse is not true, underlies the fact that all extensional definitions suffer serious deficiencies. For example:

- When we define the word ''chair'' by demonstration, if all the chairs pointed to are made of wood, observers might get the idea that ''chair'' means ''wood'' instead of something to sit on.
- When we define the word ''actor'' by enumeration, readers /listeners might think that ''actor'' means ''famous person''- which would include persons who are not actors.
- . When we define the word ''tree'' through a definition by subclass, they might get the idea that ''tree'' means ''firmly planted in the ground,'' which would also include the pilings of a building.

In other words, it makes no difference how many individuals or subclasses are named in an extensional definition, there is no assurance that listeners/readers will get the intensional meaning. Extensions can *suggest* intensions, but they cannot *determine* them.

4.2 The Intensional (Connotative) Definitional Techniques

Activity # 1: *Dear learners, how do you define inxtensional definition?*

An *intensional definition* one that assigns a meaning to a word by indicating the qualities or attributes that the word connotes. There are at least four strategies that may be used to indicate the attributes/qualities that a word connotes. These strategies result synonymous definitions, etymological definitions, operational definitions, definitions by genus and difference.

1) Synonymous Definition

Synonymous Definition is one in which the definiens is a single word that connotes the same attributes as the definiendum- that the definiens is a synonym of the word being defined.

Examples:

"Physician" means doctor.

"Observe "means see.

When a single word can be found that has the same intensional meaning as the word beng defined, a synonymous definition is a highly concise way of assigning a meaning. However, many words have subtle shades of meaning that are not connoted by any other single word. For example, the word "wisdom" is not synonymous with either "knowledge", "understanding", or "sense".

2) Etymological Definition

Etymological Definition assigns a meaning to a word by disclosing the word's ancestry in both its own language and other languages. For example, the English word ''license'' is derived from the Latin verb licere, which means to be permitted. Etymological definitions have special importance for at least two reasons. The first reason is that the etymological definition of a word often conveys the word's root meaning or seminal meaning from which all other associated meanings are derived.

Unless one is familiar with this root meaning, one often fails to place other meanings in their proper light or to grasp the meaning of the word when it is used in its most proper sense. For example, the word ‘‘principle’’ derives from the Latin word principium, which means beginning or source. Accordingly, the ‘‘principles of physics’’ are those fundamental laws that provide the ‘‘source’’ of the science of physics.

The second reason why etymological definitions have a special importance is that if one is familiar with the etymology of one word, one often has access to the meaning of an entire constellation of related words. For example, if one is familiar with the etymological definition of ‘‘polygon’’ (from the Greek words poly, meaning many, and ganos meaning angle), one might grasp the meanings of ‘‘polygamy’’ (from gamos, meaning marriage).

3) Operational Definition

Operational Definition assigns a meaning to a word by specifying certain experimental procedures that determine whether or not the word applies to a certain thing.

Examples:

One substance is ‘‘harder than’’ another if and only if one scratches the other when the two are rubbed together.
A solution is an ‘‘acid’’ if and only if litmus paper turns red when dipped into it.

Each of these definitions prescribes an operation to be performed. The first prescribes that the two substances in question be rubbed together, the second that the litmus paper be placed in the solution and observed for color change. Unless it specifies such an operation, a definition cannot be an operational definition. For example, the definition ‘‘A solution is an ‘acid’ if and only if it has a pH of less than 7,’’ while good in other respects, is not an operational definition because it prescribes no operation.

Operational definitions were invented for the purpose of tying down relatively abstract concepts to the solid ground of empirical reality. In this they succeed fairly well; yet, from the standpoint of ordinary language usage, they involve certain deficiencies. One of these deficiencies concerns the fact that operational definitions usually convey only part of the intensional meaning of a term. ‘‘Acid’’, for example, means more than blue litmus paper turning red. Moreover, operational

definitions cannot apply to terms outside the framework of science. For example, no adequate operational definition could be given for such words as ‘‘love,’’ ‘‘respect,’’ ‘‘freedom,’’ and ‘‘dignity.’’

4) Definition by Genus and Difference

Definition by Genus and Difference assigns a meaning to a term by identifying a genus term and one or more difference words that, when combined, convey the meaning of the term being defined. It is is more generally applicable and achieves more adequate results than any of the other kinds of intensional definition. To explain how it works, we must first explain the meanings of the terms ‘‘genus,’’ ‘‘species,’’ and ‘‘specific difference.’

In logic, ‘‘genus’’ and ‘‘species’’ have a somewhat different meaning than they have in biology. In logic, ‘‘genus’’ simply means a relatively larger class, and ‘‘species’’ means a relatively smaller subclass of the genus. For example, we may speak of the genus animal and the species mammal, or of the genus mammal and the species feline, or of the genus feline and the species tiger, or the genus tiger and the species Bengal tiger.

The ‘‘specific difference,’’ or ‘‘difference,’’ for short, is the attribute or attributes that distinguish the various species within a genus. Because the specific difference is what distinguishes the species, when a genus is qualified by a specific difference, a species is identified. Definition by genus and difference consists of combining a term denoting a genus with a word or group of words connoting a specific difference so that the combination identifies the meaning of the term denoting the species.

Let us construct a definition by genus and difference for the word ‘‘ice.’’ The first step is to identify a genus of which ice is the species. The required genus is water. Next we must identify a specific difference (attribute) that makes ice a special form of water. The required difference is frozen. The completed definition may now be written out:

Species		**Difference**	**Genus**
“Ice”	means	frozen	water

Therefore, it is easy to construct a definition by genus and difference. Simply select a term that is

more general than the term to be defined. Then narrow it down so that it means the same thing as the term being defined. Let us see some other similar examples:

Species		**Difference**	**Genus**
"Daughter"	means	female	offspring
"Husband"	means	married	man

Definition by genus and difference is the most effective of the intensional definitions for producing the five kinds of definition discussed in the previous lesson. Stipulative, lexical, précising, theoretical, and persuasive definitions can all be constructed according to the method of genus and difference. Lexical definitions are typically definitions by genus and difference, but they also often include etymological definitions. Operational definition can serve as the method for constructing stipulative, lexical, précising, and persuasive definitions, but because of the limitations we have noted, it typically could not be used to produce a complete lexical definition. Other techniques would have to be used in addition.

Synonymous definition may be used to produce only lexical definitions. Since this definition requires that the definiendum must have a meaning before a synonym can be found, this technique cannot be used to produce stipulative definitions. At the same time, since the definiens of such a definition contains no more information than the definiendum, it cannot be used to construct précising, theoretical, and persuasive definitions.

This account of definitions is inevitably incomplete. At the beginning of the chapter, we mentioned that all words- not just terms- stand in need of definitions, but the account given here is based on the intension and extension of terms. Nevertheless, many of the techniques developed here can be applied to words in general, and even to symbols.

Lesson 5: Criteria for Lexical Definitions

Lesson Overview

In lesson 3, we have discussed five types of definitions. Of these definitions, lexical definition is the most important and common type of definition that we often use in our day-to-day life. In this lesson, we will see the common rules of lexical definitions.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Recognize the common rules of lexical definitions.

Giving the function of a lexical definition, lexical definitions are what we most frequently encounter and are what most people mean when they speak of the ‘‘definition’’ of a word. Accordingly, it is appropriate that we have a set of rules that we may use in constructing our own lexical definitions and in evaluating the lexical definitions of others. While some of these rules apply to the other kinds of definitions as well, the unique functions that are served by stipulative, précising, theoretical, and persuasive definitions prescribe different sets of criteria.

Rule 1: ***A Lexical Definition Should Conform to the Standards of Proper Grammar.***

A definition, like any other form of expression, should be grammatically correct. For examples, the following definitions are grammatically incorrect:

Vacation is when you don’t have to go to work or school.

Furious means if you’re angry at someone.

Here are the grammatically correct definitions of the above terms:

‘‘Vacation’’ means a period during which activity is suspended from work or school.

“Furious’’ means a condition of being angry.

Technically, the definiendum should be put in quotation marks or italics, but this convention is not always followed.

Rule 2: ***A Lexical Definition Should Convey the Essential Meaning of the Word Being Defined.***

A definition cannot be helpful if it fails to convey the essential meaning of the definiendum. Any definition that defines the word ‘‘'human’’ as “featherless biped”, for instance, cannot be helpful since it fails to convey the essential meaning of ‘‘human’’ as the word is used in ordinary English.

It says nothing about the important attributes that distinguish humans from the other animals, namely, the capacity to reason and to use language on a sophisticated level. Thus, a more adequate definition would be ‘‘‘human’ means the animal that has the capacity to reason and to speak.’’

If a lexical definition is to be given in terms of an operational definition or in terms of any of the forms of extensional definition, it should usually be supplemented by one of the other forms of intensional definition, preferably definition by genus and difference. An operational definition should be supplemented, because, as we have noted above, it often conveys only part of the intensional meaning of a word, and this part frequently misses the essential meaning altogether. As for extensional definitions, at best they can only suggest the essential meaning of a word; they cannot determine it precisely. As a result, no adequate lexical definition can consist exclusively of extensional definitions.

Rule 3: ***A Lexical Definition Should Be Neither Too Broad nor Too Narrow.***

If a definition is too broad, the definiens includes too much; if it is too narrow, the definiens includes too little. If, for example, ‘‘bird’’ were defined as any warm-blooded animal having wings, the definition would be too broad because it would include bats, and bats are not birds. If, on the other hand, ‘‘bird’’ were defined as any warm-blooded, feathered animal that can fly, the definition would be too narrow because it would exclude ostriches, which cannot fly.

The only types of lexical definitions that tend to be susceptible to either of these deficiencies are synonymous definitions and definitions by genus and difference. With synonymous definitions, one must be careful that the definiens really is a synonym of the definiendum. As for definitions by genus and difference, one must ensure that the specific difference narrows the genus in exactly the right way.

Rule 4: ***A Lexical Definition Should Avoid Circularity.***

Sometimes the problem of circularity appears in connection with pairs of definitions. The following pair is circular:

“Science’’ means the activity engaged in by scientists.

“Scientist’’ means anyone who engages in science.

At other times, a definition may be intrinsically circular. Of the following, the first is a synonymous definition, the second a definition by genus and difference:

"Quiet'' means quietude.

"Silence'' means the state of being silent.

Certain operational definitions also run the risk of circularity:

"Time'' means whatever is measured by a clock.

Surely a person would have to know what ''time'' means before he/she could understand the purpose of a clock.

Rule 5: ***A Lexical Definition Should Not Be Negative When It Can Be Affirmative.***

Of the following two definitions, the first is affirmative, the second negative:

"Concord'' means harmony.

"Concord'' means the absence of discord.

Some words, however, are intrinsically negative. For them, a negative definition is quite appropriate.

Examples:

"Bald'' means lacking hair.

"Darkness'' means the absence of light.

Rule 6: ***A Lexical Definition Should Avoid Figurative, Obscure, Vague, or Ambiguous Language.***

A definition is **figurative** if it involves metaphors or tends to paint a picture instead of exposing the essential meaning of a term. Example:

"Camel'' means a ship of the desert.

A definition is **obscure** if its meaning is hidden as a result of defective or inappropriate language. One source of obscurity is overly technical language. Compare the following two definitions:

"Bunny'' means a mammalian of the family Leporidae of the order Lagomorpha whose young are born furless and blind.

"Bunny'' means a rabbit.

The problem lies not with technical language as such but with needlessly technical language. Because ''bunny'' is very much a nontechnical term, no technical definition is needed. However, some words are intrinsically technical, and for them only a technical definition will be appropriate.

A definition is **vague** if it lacks precision or if its meaning is blurred- that is, if there is no way of telling exactly what class of things the definiens refers to. Example:

"Democracy'' means a kind of government where the people are in control.

This definition fails to identify the people who are in control, how they exercise their control, and what they are in control of.

A definition is **ambiguous** if it lends itself to more than one distinct interpretation. Example:

''Triangle'' means a figure composed of three straight lines in which all the angles are equal to 180.

Does this mean that each angle separately is equal to 180 or that the angles taken together are equal to 180? Either interpretation is possible given the ambiguous meaning of ''all the angles are equal to 180.''

Rule 7: ***A Lexical Definition Should Avoid Affective Terminology.***

Affective terminology is any kind of word usage that plays upon the emotions of the reader or listener. It includes sarcastic and facetious language and any other kind of language that is liable to influence attitudes. Example:

"Communism'' means that ''brilliant'' invention of Karl Marx and other foolish political visionaries in which the national wealth is supposed to be held in common by the people.

Rule 8: A Lexical Definition Should Indicate the Context to Which the Definiens Pertains.

This rule applies to any definition in which the context of the definiens is important to the meaning of the definiendum. Examples:

"Strike'' means (in baseball) a pitch at which a batter swings and misses.

''Strike'' means (in bowling) the act of knocking down all the pins with the first ball of a frame.

''Strike'' means (in fishing) a pull on a line made by a fish in taking the bait.

It is not always necessary to make explicit reference to the context, but at least the phraseology of the definiens should indicate the context.

Chapter Summary

Language is the most important thing in the study of logic. Giving that logic is the study of arguments, and language is the fundamental tool of communication, there is not only a strong relationship between language and logic but also the former has a prominent position within the discipline of the latter. Argument, as the most special subject matter of logic, is nothing but a reasoning process that is constructed and conveyed through language. The clarification and analysis of terms and statements is the objective of philosophy in general and logic in particular. In order to interpret, analyze, and evaluate arguments well, one must pay close attention to language. Many errors in logic stem from a careless or imprecise use of language, and many misunderstandings about the nature of language. Hence, if we are to successfully evaluate the logical correctness of arguments, it is important to pay a special attention to the language in which the arguments are cast. More specially, meanings and definitions are very important both, for clear, effective, and comprehensive communications, and for logical, scientific, and critical evaluations of arguments. Before we decide whether the requirements of a certain argument are fulfilled, it is necessary to understand the meanings of the words that make up the statements, which in its turn, make up the given argument.

Language has two fundamental functions in logic, conveying information and expressing or evoking feeling, which are expressed through some terminologies. Those terminologies that convey information are said to have *cognitive meanings*, and those that expresses or evokes feelings are said to have *emotive meanings*. Emotively charged statements usually have both cognitive meaning and emotive meaning. However, since logic is concerned chiefly with cognitive meaning, our primary concern should be to distinguish and disengage the cognitive meaning of emotive statements from the emotive meaning, which is commonly known as a *value claim*. Value claims are usually the most important part of the cognitive meaning of emotive statements. Thus, for the purposes of logic, it is important that we be able to disengage the value claims of emotively charged statements from the emotive meaning and treat these claims as separate statements.

Vagueness and ambiguity are the two linguistic problems that affect our cognitive use of language. A linguistic expression is said to be *vague* if there are borderline cases in which it is impossible to tell if the expression applies or does not apply. Vague expressions often allow for a continuous

range of interpretations. An expression is said to be *ambiguous* when it can be interpreted as having more than one clearly distinct meaning in a given context. The role of vagueness and ambiguity in arguments may be conveniently explored in the context of conflicting arguments between individuals. Such conflicts are called *disputes*. Disputes can be *verbal* or *factual*. The former centers on a confusion of cognitive meanings between disputants, while the later on a matter of fact.

Terms symbolize two kinds of meanings: intensional meaning and extensional meaning. The *intensional meaning*, which is otherwise known as *intension* or *connotation*, consists of the qualities or attributes that the term connotes, and the extensional meaning, which is otherwise known as *extension* or *denotation*, consists of the members of the class that the term denotes. To avoid the subjective elements that invades the notion of connotation, and of course that of denotation, logicians typically restrict the meaning of connotation and denotation to the *conventional connotation and denotation*. Sometimes extensions can be empty, but intensions.

Meanings are conveyed or explicated by definitions. A *definition* is a group of words that assigns a meaning to some word or group of words; and consists of two parts: the *definiendum*, (the word or group of words that is supposed to be defined), and the *definiens*, (the word or group of words that does the defining). It is, however, important to note that the definiens is not itself the meaning of the definiendum; rather, it is the group of words that symbolizes (or that is supposed to symbolize) the same meaning as the definiendum. There are various kinds of definitions that are actually used in our practical life. Based on the functions they actually serve, definitions can be classified as *stipulative, lexical, précising, theoretical, and persuasive definitions.* These definitions can be produced by extensional definitional techniques, (demonstrative/ostensive, enumerative, and subclass), and intensional definitional techniques, (synonymous, etymological, operational, and genus and difference). Because lexical definition the most important and common definition, it is important for it to fulfill some standard linguistic rules.

Self Check Exercise

1. Explain the relationship between logic and language.

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2. Discuss the important functions of language that are relevant to logic.

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3. Explain the meaning and function of a value claim in arguments.

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4. Explain the differences between vagueness and ambiguity, and between verbal and factual disputes.

_____

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5. Explain the differences between intensional meaning and extensional meaning.

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6. Discuss briefly the major types of definitions.

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7. Discuss briefly the similarities and differences between extensional and intensional definitional techniques. Support your discussion with your own examples.

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_____

8. Discuss the standard rules of a lexical definition. Support your discussion with your own examples.

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CHAPTER FOUR

BASIC CONCEPTS OF CRITICAL THINKING

Chapter Overview

This chapter is about the power of disciplined thinking. It is about learning to think for yourself and being your own person. In many high schools, the emphasis of education tends to be on "lower-order thinking." Students are simply expected to passively absorb information and then repeat it back on tests. In college and universities, by contrast, the emphasis is on fostering "higher-order thinking": the active, intelligent evaluation of ideas and information. *As* Martin Luther King Jr rightly puts it as "The function of education is to teach one to think intensively and to think critically". The main goal of teaching Critical Thinking is therefore, to teach students how to think; that is, how to become independent, self-directed thinkers and learners. It is about the personal empowerment and enrichment that result from learning to use your mind to its fullest potential. In short, it is about critical thinking. In this chapter, we deal with the Meaning, Standards, Principles, Characteristics, Barriers, and Benefits of critical thinking,

Chapter Objectives:

At the end of this chapter, students will be able to:

- Define critical thinking.
- Understand the standards of critical thinking.
- Appreciate the principles of good argument and critical thinking.
- Understand the characteristics of critical thinking.
- Identify the barriers of critical thinking.
- Recognize the benefits of critical thinking.

Lesson 1: Meaning of Critical Thinking

Lesson Overview

Critical thinking can be defined as a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims. In this lesson, we will learn the meaning and general picture of critical thinking.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Understand the meaning and general picture of critical thinking.

Activity # 1: *Dear learners, what do you think is critical thinking?*

Critical means involving or exercising skilled judgment or observation. In this sense, critical thinking means thinking clearly and intelligently. More precisely, critical thinking is the general term given to a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims. Moreover, it helps to discover and overcome personal preconceptions and biases; to formulate and present convincing reasons in support of conclusions; and to make reasonable, intelligent decisions about what to believe and what to do.

However, it does not automatically follow that being intelligent means being able think critically or reason about information in a useful, effective and efficient manner. Being smart and intelligent is not sufficient. Critical thinking is a process or journey that helps us to arrive at the most useful, helpful, and most likely destinations when evaluating claims for scientific truth. Critical thinking, thus, is thinking clearly, thinking fairly, thinking rationally, thinking objectively, and thinking independently. It is a process that hopefully leads to an impartial investigation of the data and facts that remains not swayed by irrelevant emotions. Therefore, the aim of critical thinking is to arrive at well-reasoned, considered, and justifiable conclusions.

The American philosopher, John Dewey, has defined critical thinking as an *active, persistent, and careful consideration of a belief or supposed form of knowledge in the light of the grounds, which support it and the further conclusions to which it tends.* In this definition, there are three main points that we should focus on: *active, persistent* and *grounds*.

The first point is that critical thinking is an 'active' process. By defining critical thinking as an 'active' process, Dewey is contrasting it with the kind of thinking in which you just receive ideas and information from other people – what you might reasonably call a 'passive' process. For Dewey, critical thinking is essentially an active process – one in which you think things through for yourself, raise questions yourself, find relevant information yourself and so on, rather than learning in a largely passive way from someone else. The second point is that critical thinking is persistent and careful consideration. Here, Dewey is contrasting critical thinking with the kind of unreflective thinking we all sometimes engage in. For example, we sometimes jump to a conclusion or make a quick decision without thinking about it. Of course, sometimes, we may have to do this because we need to decide quickly or the issue is not important enough to warrant careful thought, but we often do it when we ought to stop and think – when we ought to persist a bit.

However, the most important point in Dewey's definition lies in what he said about the 'grounds which support' a belief and the 'further conclusions to which it tends'. What Dewey is saying, to express it in a more familiar language, is that what matters are the *reasons* we have for believing something and the implications of our beliefs. It is no exaggeration to say that critical thinking attaches huge importance to reasoning, to giving reasons and to evaluating reasoning as far as possible. There is more to it than that, but skilful reasoning is a key element.

Dewey's definition, though it is important, misses some important features of critical thinking. Let us now see the other definition given by Edward Glaser. Edward Glaser defined critical thinking as: *(1) an attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one's experience; (2) knowledge of the methods of logical enquiry and reasoning; and (3) some skill in applying those methods.*

If we closely observe Glaser's definition, it is immediately obvious that this definition owes a lot to Dewey's original definition. Glaser uses the term 'evidence' in place of 'grounds' but otherwise

the second sentence is much the same. But there are two points which stands out in this definition. The first sentence speaks about an attitude or disposition to be thoughtful about problems and recognizes that you can apply what he calls 'the methods of logical enquiry and reasoning' with more or less 'skill'. The tradition has picked up on both these elements, recognizing that critical thinking is partly a matter of having certain thinking skills. But it is not just a matter of having these skills; it is also a matter of being disposed to use them. Critical thinking combines these habits and abilities in approaching and understanding our experience.

The other most famous contributors to the development of the critical thinking tradition is Robert Ennis. He defined critical thinking as *reasonable, reflective thinking that is focused on deciding what to believe or do*. Notice that the emphasis on being 'reasonable' and 'reflective' in this definition is similar with the above two definitions. But notice also that Ennis speaks of 'deciding what to . . . do', which was not explicitly mentioned in the above definitions. So decision-making is an important part of critical thinking in Ennis's conception. What we learn from Ennis' definition is that when we make a decision, we should be serious about it. The decision may be about purchasing a phone, or it may be about choosing a department, or any other issues. But we should employ critical thinking to make a decision.

Here is another important definition of critical thinking is given by Richard Paul: *Critical thinking is that mode of thinking – about any subject, content or problem – in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them.* Paul associates critical thinking with reflecting on thoughts. This definition is interesting and somehow looks different from the other definitions given above. It draws attention to a feature of critical thinking on which scholars in the field seem to be largely agreed - that the only realistic way to develop one's critical thinking ability is through 'thinking about one's thinking' (often called 'meta-cognition'), and consciously aiming to improve it by reference to some model of good thinking in that domain.

One last definition is worth reviewing. Michael Scriven has defined critical thinking as *skilled and active interpretation and evaluation of observations and communications, information and argumentation.* He argued that critical thinking is an academic competency akin to reading and writing and is of similarly fundamental importance. It is worth unpacking Scriven's definition a

little. He defines critical thinking as a 'skilled' activity for reasons similar to those mentioned above. He points out that thinking does not count as critical merely because it is intended to be, any more than thinking counts as scientific simply because it aims to be. To be critical, thinking has to meet certain standards, (clarity, relevance, reasonableness and so on), and one may be *more* or *less* skilled at this. He defined critical thinking as an 'active' process, partly because it involves *questioning* and partly because of the role played by *meta-cognition*. He includes 'interpretation' of texts, speech, film, graphics, actions and even body language, because 'like explanation, interpretation typically involves constructing and selecting the best of several alternatives, and it is a crucial preliminary to drawing conclusions about complex claims'. He includes 'evaluation' because 'this is the process of determining the merit, quality, worth, or value of something' and much critical thinking is concerned with evaluating the truth, probability or reliability of claims.

The above definitions, though may not give exhaustive definition by themselves, they nevertheless provide an important conception of critical thinking together. Before closing the explication of critical thinking, however, we should focus on the other aspects of critical thinking.

Critical thinking is sometimes referred to as 'criticocreative' thinking. This word is the combination of two words: *critical* and *creative*. There are two related reasons for this. The first is that the term 'critical thinking' is sometimes thought to sound rather negative, as though one's only interest is in adversely criticizing other people's arguments and ideas. This would be a serious mistake since (and this is the second reason) to be good at evaluating arguments and ideas, one often has to be very imaginative and creative about other possibilities, alternative considerations, different options and so on. To be a good judge of issues, it is not enough to see faults in what other people say. You need to base your judgment on the best arguments you can devise in the time available; and this often requires you to think of relevant considerations other than those presented, look at issues from different points of view, imagine alternative scenarios and perhaps find other relevant information – in short, you will need to be quite creative. For these reasons, some writers have wanted to speak of 'criticocreative' thinking to emphasize the positive, imaginative aspects of critical thinking. Unfortunately, the result is a rather cumbersome expression so we shall use the term 'critical thinking', which is now so widely used, whilst understanding it in this positive, imaginative sense. In short, critical thinking is a kind of evaluative

thinking – which involves both criticism and creative thinking – and which is particularly concerned with the quality of reasoning or argument that is presented in support of a belief, or a course of action.

Lesson 2: Standards of Critical Thinking

Lesson Overview

Critical thinking is a disciplined thinking governed by clear intellectual standards. But, not every thinking is critical. To identify a critical thinking from the uncritical, we refer to some standards. There is a consensus among philosophers that for thinking to be critical, it has to meet certain standards. Standard of critical thinking refers a conditions or a level that critical thinking should meet to be considered as normal and acceptable. Among the most important of these intellectual standards are clarity, precision, accuracy, relevance, consistency, logical correctness, completeness, and fairness. In this lesson, we will discuss these standards.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Recognize the important intellectual standards of critical thinking.

Activity # 2: *Dear learners, do you know any standard of critical thinking? How do you identify good critical thinking from bad critical thinking? What basic standards do you think critical thinking should meet?*

Dear learners, we have seen that the term 'critical thinking' generally refers to a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims. It is critical thinking is a disciplined thinking governed by clear intellectual standards that can be used to identify a critical thinking from the uncritical. Standard of critical thinking refers a conditions or a level that critical thinking should meet to be considered as normal and acceptable. *Clarity, precision, accuracy, relevance, consistency, logical correctness, completeness,* and *fairness* are some of the most important intellectual standards of critical thinking. Let us discuss these standards in detail.

1) *Clarity*

Clarity refers to clear understanding of concepts and clearly expressing them in a language that is free of obscurity and vagueness. When we construct argument, we should take into consideration or pay close attention to clarity. Before we can effectively evaluate a person's argument or claim, we need to understand clearly what the person is saying. Unfortunately, that can be difficult because people often fail to express themselves clearly.

But clarity is a gateway standard. If a statement is unclear, we cannot determine whether it is accurate or relevant. In fact, we cannot tell anything about it because we do not yet know what it is saying. For example, the question "What can be done about the education system in Ethiopia?" is unclear. In order to address the question adequately, we would need to have a clearer understanding of what the person is asking. The question is considering the "problem" to be. A clearer question might be "What can educators do to ensure that students learn the skills and abilities which help them function successfully on the job and in their daily decision-making?"

Sometimes lack of clarity is due to laziness, carelessness, or a lack of skill. At other times, it results from a misguided effort to appear clever, learned, or profound. As William Strunk Jr. and E. B. White, in their classic, '*The Elements of Style'*, remark that "*Muddiness is not merely a disturber of prose, it is also a destroyer of life, of hope: death on the highway caused by a badly worded road sign, heartbreak among lovers caused by a misplaced phrase in a well-intentioned letter. . . .Only by paying careful attention to language can we avoid such needless miscommunications and disappointments.*

Critical thinkers, however, not only strive for clarity of language but also seek maximum clarity of thought. To achieve our personal goals in life, we need a clear conception of our goals and priorities, a realistic grasp of our abilities, and a clear understanding of the problems and opportunities we face. Such self-understanding can be achieved only if we value and pursue clarity of thought.

2) *Precision*

Precision is a matter of being exact, accurate and careful. Most ideas are vague and obscures though we think we have precise understanding of them. When we try to meticulous these ideas, we will find that they are imprecise. To get precise understanding, we should pay close attention to details. Everyone recognizes the importance of precision in specialized fields such as medicine, mathematics, architecture, and engineering.

Critical thinkers also understand the importance of precise thinking in different contexts. They understand that to cut through the confusions and uncertainties that surround many everyday problems and issues, it is often necessary to insist on precise answers to precise questions: What exactly is the problem we are facing? What exactly are the alternatives? What exactly are the advantages and disadvantages of each alternative? Only when we habitually seek such precision are we truly become critical thinkers.

3) *Accuracy*

Accuracy is about correct information. Critical thinking should care a lot about genuine information. If the ideas and thoughts one processes are not real, then once decision based on wrong and false information will likely to result in distorting realities. John Rawls, in his book entitled as '*A Theory of Justice'* argued that *truth is the first virtue of systems of thought. A theory however elegant and economical must be rejected or revised if it is untrue.* Whether an idea is attractive or sophisticated should be abandoned if it is based on false information.

Accuracy is about having and getting true information. There is a well-known saying about computers: "Garbage in, garbage out."Simply put, this means that if you put bad information into a computer, bad information is exactly what you will get out of it. Much the same is true of human thinking. No matter how brilliant you may be, you are almost guaranteed to make bad decisions if your decisions are based on false information. Critical thinkers do not merely value the truth; they also have a *passion* for accurate, timely information. As consumers, citizens, workers, and parents, they strive to make decisions and this decision should be based on true information.

4) *Relevance*

The question of relevance is a question of connections. When there is a discussion or debate, it should focus on relevant ideas and information. That is, only those points that bear on the issue should be raised. A favorite debaters' trick is to try to distract an audience's attention by raising an irrelevant issue. Critical thinkers do not collect any information; they focus and carefully choose only the information that has logical relation with the ideas at hands. Issues raised should have logical connection with the question at hand. Two ideas are relevant when they have logical connection. A critical thinker should be relevant in his ideas and thoughts.

5) *Consistency*

Consistency is about the quality of always behaving in the same way or of having the same opinions or standards. It is easy to see why consistency is essential to critical thinking. Logic tells us that if a person holds inconsistent beliefs, at least one of those beliefs must be false. Critical thinkers prize truth and so are constantly on the lookout for inconsistencies, both in their own thinking and in the arguments and assertions of others.

There are two kinds of inconsistency that should be avoided. One is *logical inconsistency,* which involves saying or believing inconsistent things (i.e., things that cannot both or all be true) about a particular matter. The other is *practical inconsistency,* which involves saying one thing and doing another. Sometimes people are fully aware that their words conflict with their deeds; in short people sometime are hypocrites. From a critical thinking point of view, such personality is not especially interesting. As a rule, they involve failures of character to a greater degree than they do failures of critical reasoning.

More interesting from a critical thinking standpoint are cases in which people are not fully aware that their words conflict with their deeds. Such cases highlight an important lesson of critical thinking: human beings often display a remarkable capacity for self-deception. Author Harold Kushner, in this respect, writes as:

[a]sk the average person which is more important to him, making money or being devoted to his family, and virtually everyone will answer family without hesitation. But watch how the average person actually lives out his life. See where he really invests his time and energy, and he will give

away the fact that he really does not live by what he says he believes. He has let himself be persuaded that if he leaves for work earlier in the morning and comes home more tired at night, he is proving how devoted he is to his family by expending himself to provide them with all the things they have seen advertised.

Critical thinking helps us become aware of such unconscious practical inconsistencies, allowing us to deal with them on a conscious and rational basis. It is also common, of course, for people to hold unknowingly inconsistent beliefs about a particular subject. In fact, as Socrates pointed out long ago, such unconscious logical inconsistency is far more common than most people suspect. For example, many today claim that morality is relative, while holding a variety of views that imply that it is not relative. Critical thinking helps us to recognize such logical inconsistencies or, still better, avoid them altogether. A critical thinker should be consistent logically and practically.

6) Logical Correctness

To think logically is to reason correctly; that is, to draw well-founded conclusions from the beliefs held. To think critically, we need accurate and well supported beliefs. But, just as important, we need to be able to reason from those beliefs to conclusions that logically follow from them. Unfortunately, illogical thinking is all too common in human affairs. When we think, we bring a variety of thoughts together into some order. When the combinations of thoughts are mutually supporting and make sense in combination, the thinking is logical. When the combination is not mutually supporting, is contradictory in some sense, or does not make sense the combination, is not logical.

7) Completeness

In most contexts, we rightly prefer deep and complete thinking to shallow and superficial thinking. Of course, there are times when it is impossible or inappropriate to discuss an issue in depth; no one would expect, for example, a thorough and wide-ranging discussion of the ethics of the right to self- determination in a short newspaper editorial. However, thinking is better when it is deep rather than shallow, thorough rather than superficial.

8) Fairness

Critical thinking demands that our thinking be fair - that is, open minded, impartial, and free of distorting biases and preconceptions. That can be very difficult to achieve. Even the most superficial acquaintance with history and the social sciences tells us that people are often strongly disposed to resist unfamiliar ideas, to prejudge issues, to stereotype outsiders, and to identify truth with their own self-interest or the interests of their nation or group.

It is probably unrealistic to suppose that our thinking could ever be completely free of biases and preconceptions; to some extent, we all perceive reality in ways that are powerfully shaped by our individual life experiences and cultural backgrounds. But as difficult as it may be to achieve, basic fair-mindedness is clearly an essential attribute of a critical thinker.

We naturally think from our own perspective, from a point of view, which tends to privilege our position. Fairness implies the treating of all relevant viewpoints alike without reference to one's own feelings or interests. Because we tend to be biased in favor of our own viewpoint, it is important to keep the standard of fairness at the forefront of our thinking. This is especially important when the situation may call on us to see things we do not want to see, or give something up that we want to hold onto.

Lesson 3: Codes of Intellectual Conduct for Effective Discussion

Lesson Overview

We have learned in chapter two that a good argument is constituted by two or more explicit and/or implicit claims, one or more of which supports or provides evidence for the truth or merit of another claim, the conclusion. We have also seen in the previous lesson that critical thinking' is a disciplined thinking that provide a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims; and governed by clear intellectual standards that can be used to identify a critical thinking from the uncritical. But the question is that how can we measure the goodness or badness of an argument?, and how is that some thinking are critical, and some are not. In this lesson, we will discuss the basic codes of

intellectual conduct, especially the common principles of a good argument as well as that of a critical thinking.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Recognize the important principles of good arguments.
- Appreciate the basic principles of a critical thinking.

3.1 Principles of Good Argument

Activity # 3: *Dear learners, how do you distinguish a good argument from a bad one?*

A discussion may involve two or more participants or it may simply be an internal discussion with oneself. In either case, one who wishes to construct the strongest possible arguments for his or her views, and to do one's part in resolving conflicts concerning issues that matter, should make each of the following principles a part of his or her intellectual style:

1) The Structural Principle

The structural principle of a good argument requires that one who argues for or against a position should use an argument that meets the fundamental structural requirements of a well-formed argument. Such an argument does not use reasons that contradict each other, that contradict the conclusion, or that explicitly or implicitly assume the truth of the conclusion. Neither does it draw any invalid deductive inferences.

The first criterion used in determining whether an argument is a good one is the requirement that it be structurally sound. An argument must look and works like an argument. In other words, it should be formed in such a way that the conclusion either follows necessarily from its premises, in the case of deductive arguments, or follows probably from its premises, in the case of inductive arguments.

A good argument should also provide us with reasons to believe that the conclusion deserves our acceptance. Since most discussions about controversial issues are initiated because the argument's conclusion has not yet been accepted by all participants, the arguer will use premises that are more likely to be accepted than the conclusion. If those premises are accepted and they lead to the conclusion, it is more likely that the conclusion will also be accepted.

Another structural feature of an argument that could render it fatally flawed would be one whose premises are incompatible with one another. An argument that has such premises is one from which any conclusion, no matter how outrageous, can be drawn. The fact that an argument with incompatible premises may yield an absurd result demonstrates that it cannot even function as an argument— let alone a good one. It certainly cannot help us decide what to do or believe. The same is true of an argument with a conclusion that contradicts one of the premises. A conclusion that contradicts another claim in the same argument violates the law of non-contradiction.

2) The Relevance Principle

This is the second principle of a good argument that requires that one who presents an argument for or against a position should set forth only reasons whose truth provides some evidence for the truth of the conclusion.

The premises of a good argument must be relevant to the truth or merit of the conclusion. There is no reason to waste time assessing the truth or acceptability of a premise if it is not even relevant to the truth of the conclusion. A premise is relevant if its acceptance provides some reason to believe, counts in favor of, or has some bearing on the truth or merit of the conclusion. A premise is irrelevant if its acceptance has no bearing on, provides no evidence for, or has no connection to the truth or merit of the conclusion.

One may want to ask two questions in an effort to determine whether a particular premise or reason is relevant. First, would the premise's being true in any way make one more likely to believe that the conclusion is true? If the answer is yes, the premise is probably relevant. If the answer is no, the premise is probably not relevant. Second, even if the premise is true, should it be a consideration in the determination of whether or not the conclusion of the argument is true? For example, does the fact that an idea that is widely accepted by most people can be considered as a

sign that the idea itself is good. ? If the answer is no, then a premise that asserts that claim is irrelevant. If the answer is yes, which is unlikely in this case, then the premise should be regarded as relevant.

3) The Acceptability Principle

The third principle of a good argument is the acceptability principle. This principle requires that one who presents an argument for or against a position should provide reasons that are likely to be accepted by a mature, rational person and that meet standard criteria of acceptability. The reasons set forth in support of a conclusion must be acceptable. A reason is acceptable if it is the kind of claim that a rational person would accept in the face of all the relevant evidence available. Some people believe that the acceptability principle should be replaced by the truth principle to connote the idea that premises should be true to be acceptable. However, the term "acceptable" is preferable to the more traditional term "true" for several reasons.

First, the notion of acceptability stems from the very nature of argumentative interchange. In most argumentative situations, the key to achieving agreement on the conclusion is achieving acceptance of the premises. The arguer typically starts with premises that the sceptic is likely to accept or that a rational person ought to accept. Upon acceptance of the premises, assuming that other criteria of a good argument are satisfied, the opponent is logically led to the acceptance of the conclusion.

Second, since it is notoriously difficult to establish the absolute truth of any statement, it would be an impractical requirement of a good argument that its premises must be true in any absolute sense. Indeed, if such a condition were enforced, there would be very few good arguments. The most that we can legitimately expect is what a reasonable person would accept as true.

Third, an analysis of our language suggests that in many ordinary contexts, what we typically mean by the word "true" would be more appropriately expressed by the phrase "accepted as true." Consider, for example, the contradictory testimony from courtroom witnesses, each of whom is allegedly telling the truth. A better way to describe what is happening there is that each witness is presumably telling what he or she honestly accepts as true.

Fourth, even if a premise were true in the absolute sense, it may be unacceptable to a particular audience because that audience may not be in a position to determine its truth. For example, the evidence for a premise may be inaccessible to them in that it is too technical for them to understand. The truth of the premise would therefore not add anything to the practical force of the argument. An argument can be a good one only if the premises are accepted or recognized as true.

4) The Sufficiency Principle

The four principle of a good argument is the sufficiency principle, which requires that one who presents an argument for or against a position should attempt to provide relevant and acceptable reasons of the right kind, that together are sufficient in number and weight to justify the acceptance of the conclusion.

The feature of the sufficiency principle that is most difficult to apply is the assignment of weight to each piece of supporting evidence. Indeed, disagreement over this issue probably causes most of the problems in informal discussions. What one participant regards as the most important piece of evidence, another may regard as trivial by comparison with other possible evidence. It is not likely that we will come to closure in a dispute until we come to some kind of agreement about the relative weight to give to the kinds of relevant and acceptable evidence used in support of a conclusion.

One should ask several questions when applying the sufficiency test to a particular argument. First, are the reasons that are given, even if they are relevant and acceptable, enough to drive one to the arguer's proposed conclusion? Second, is the evidence presented flawed by some kind of faulty causal analysis? Finally, is some key or crucial evidence simply missing from the argument that must be included as one of the premises in order for one to accept the argument's conclusion? Answer to these questions will tell us if the premises are sufficient.

5) The Rebuttal Principle

The last principle of a good argument is the rebuttal principle. This principle requires that one who presents an argument for or against a position should include in the argument an effective rebuttal

to all anticipated serious criticisms of the argument that may be brought against it or against the position it supports.

Since an argument is usually presented against the background that there is another side to the issue, a good argument must meet that other side directly. An argument cannot be a good one if it does not anticipate and effectively refute or blunt the force of the most serious criticisms against it and the position that it supports.

A complete argument might even refute the arguments mustered in behalf of alternate positions on the issue in question. One must ask and answer several questions in applying the rebuttal principle to an argument. First, what are the strongest arguments against the position being defended? Second, does the argument address the counterarguments effectively? Third, what potentially serious weaknesses in the argument for the position might be recognized by an opponent? Fourth, does the argument itself recognize and address those possible weaknesses? Finally, does the argument show why arguments for alternative positions on the issue are flawed or unsuccessful?

Arguments can fail to meet the rebuttal principle in several ways and those wishing to avoid the responsibility of rebuttal commonly use several diversionary tactics. For example, arguments that misrepresent the criticism bring up trivial objections or a side issue, or resort to humor or ridicule are using devices that clearly fail to make effective responses. The same can be said of those arguments that ignore or deny the counterevidence against the position defended. Finally, some arguers try to avoid responding to a criticism by attacking the critic instead of the criticism. All of these approaches are clear violations of our obligation to respond honestly to the arguments of our opponents.

3.2 Principles of Critical Thinking

Activity # 4: *Dear learners, how do you distinguish a critical thinking from the an uncritical one?*

Having discussed the major principles of a good argument, let us now see the principles of a critical thinking as parts of the codes of intellectual conduct.

1) The Fallibility Principle

The first principle of a critical thinking is the fallibility principle. This principle requires that each participant in a discussion of a disputed issue should be willing to accept the fact that he or she is fallible, which means that one must acknowledge that one's own initial view may not be the most defensible position on the question.

To employ the fallibility principle in a discussion is consciously to accept the fact that you are fallible, that is, that your present view may be wrong or not the most defensible view on the matter in dispute. If you refuse to accept your own fallibility, you are, in effect, saying that you are not willing to change your mind, even if you hear a better argument. This is pretty strong evidence that you do not intend to play fairly, and there is no real point in continuing the discussion. An admission of fallibility, however, is a positive sign that you are genuinely interested in the kind of honest inquiry that may lead to a fair resolution of the issue. Given the great number of issues that divide us and the large number of different positions on each of those issues, it is more likely that a person would turn out to be wrong on more issues than right.

2) The Truth Seeking Principle

The second principle of a critical thinking is the truth seeking principle. This principle requires that each participant should be committed to the task of earnestly searching for the truth or at least the most defensible position on the issue at stake. Therefore, one should be willing to examine alternative positions seriously, look for insights in the positions of others, and allow other participants to present arguments for or raise objections to any position held on an issue.

The search for truth is lifelong endeavor, which principally takes the form of discussion, wherein we systematically entertain the ideas and arguments of fellow seekers after truth, while at the same time thoughtfully considering criticisms of our own views. If we really are interested in finding the truth, it is imperative not only that we assume that we may not now have the truth, but that we listen to the arguments for alternative positions and encourage criticism of our own arguments.

We probably all want to hold only those opinions that really are true, but the satisfaction of that interest comes at a price - a willingness to look at all available options and the arguments in support of them. Otherwise, we might miss the truth completely. The problem, of course, is that most of us want the truth to be what we now hold to be the truth.

3) The Clarity Principle

The clarity principle is the third principle of a critical thinking. It requires that the formulations of all positions, defences, and attacks should be free of any kind of linguistic confusion and clearly separated from other positions and issues. Any successful discussion of an issue must be carried on in language that all the parties involved can understand. Even if what we have to say is perfectly clear to ourselves, others may not be able to understand us. A position or a criticism of it that is expressed in confusing, vague, ambiguous, or contradictory language will not reach those toward whom it is directed, and it will contribute little to resolving the issue at hand.

4) The Burden of Proof Principle

The fourth principle of a critical thinking is the burden of proof principle. This principle requires that the burden of proof for any position usually rests on the participant who sets forth the position. If, and when, an opponent asks, the proponent should provide an argument for that position.

Just as a person is generally held accountable for his or her own actions, one who makes a positive or negative claim about something has what is called the burden of proof. In many cases, of course, one does not have to supply such proof, for we are not always challenged to defend our claims. But if the claimant is asked “Why?” or “How do you know that is true?” he or she is logically obligated to produce reasons on behalf of the claim. An exception to this rule is a situation in which the claim in question is well established or uncontroversial. In such a case, the

burden of proof might rest on the one who wishes to challenge that claim. One has the responsibility to provide evidence for one's conclusion and for any questionable premise, if asked to do so.

To ask others to accept your claim without any support, or to shift the burden of proof to them by suggesting that your position is true unless they can prove otherwise, is to commit the fallacy of "arguing from ignorance," for you are, in this way, making a claim based on no evidence at all.

5) The Principle of Charity

This is the fifth principle of a critical thinking that requires that if a participant's argument is reformulated by an opponent, it should be carefully expressed in its strongest possible version that is consistent with what is believed to be the original intention of the arguer. If there is any question about that intention or about any implicit part of the argument, the arguer should be given the benefit of any doubt in the reformulation and/or, when possible, given the opportunity to amend it.

Good discussion in general and argumentation in particular impose an ethical requirement on their participants. But there is also a practical reason for being fair with one another's arguments. If we deliberately create and then attack a weak version of the original argument, we will probably fail to achieve the very goals that discussion is designed to serve. If we are really interested in the truth or the best answer to a problem, then we will want to evaluate the best version of any argument set forth in support of one of the options. Hence, if we don't deal with the best version now, we will eventually have to do so, once an uncharitable version has been corrected by the arguer or others. We would do well, then, to be fair about it in the first place by letting our opponents amend any portion of our reconstruction of their arguments.

6) The Suspension of Judgment Principle

The sixth principle of a critical thinking is the suspension of judgment principle. This principle requires that if no position is defended by a good argument, or if two or more positions seem to be defended with equal strength, one should, in most cases, suspend judgment about the issue. If practical considerations seem to require a more immediate decision, one should weigh the relative

benefits or harm connected with the consequences of suspending judgment and decides the issue on those grounds.

If suitable evidence is so lacking that one has no good basis for making a decision either way, it may be quite appropriate to suspend judgment on the matter and wait until there is more of a basis for decision. This alternative should not, however, be seen as a clever way to avoid the psychological fright of making a difficult decision or of moving into unfamiliar territory.

7) The Resolution Principle

The last principle of a critical thinking is the resolution principle. This principle requires that an issue should be considered resolved if the argument for one of the alternative positions is a structurally sound, one that uses relevant and acceptable reasons that together provide sufficient grounds to justify the conclusion and that also include an effective rebuttal to all serious criticisms of the argument and/or the position it supports. Unless one can demonstrate that the argument has not met these conditions more successfully than any argument presented for alternative positions, one is obligated to accept its conclusion and consider the issue to be settled. If the argument is subsequently found by any participant to be flawed in a way that raises new doubts about the merit of the position it supports, one is obligated to reopen the issue for further consideration and resolution.

If the purpose of rational discussion is ultimately to decide what to do or believe, then coming to closure should happen more often than it does. There are many good arguments out there, and if good arguments resolve issues, why are not more issues resolved? How much more discussion is needed, just because some refuse to recognize the force of a good argument? Unfortunately, very few controversial issues ever come to rational resolution. If you have doubts about this, then ask yourself when the last time was that you allowed the force of argument to change your mind about an important issue - even though changing one's mind in the face of a good argument should not be a difficult thing to do for a genuine truth-seeker.

So why does it not happen? Why are issues not resolved? There are probably a number of reasons. It could be that one of the parties to the dispute has a blind spot; that is, he or she simply cannot be objective about the particular issue at hand. Or maybe he or she has been rationally but not

psychologically convinced by the discussion. Another possible explanation is that one or more of the parties in the dispute have been rationally careless or at least guilty of not thinking as clearly as they should. It is even possible that one of the parties has a hidden agenda - an issue to defend other than the stated one. Or maybe the parties involved are simply not being honest with themselves, for they may want to win the argument more than they want to find a solution to the problem. Finally, perhaps the parties are in what might be called deep disagreement. In other words, they are divided on the issue because of fundamental underlying assumptions that have yet to be explored.

No argument, however, being regarded as permanently successful. There is always the possibility that new evidence will come to light that will raise new doubts about a position hold on what were thought to be good grounds. Under these conditions, further examination is always appropriate. Pride in holding a position defended by a good argument in the past should not become an obstacle to reopening the issue in the present if conditions warrant it. The new doubts, however, should not be the same old doubts in new clothing. Reopening the issue should come only as a consequence of uncovering new or reinterpreted evidence not considered in the earlier treatment of the issue.

Lesson 4: Characteristics of Critical Thinking

Lesson Overview

So far, in this chapter, we have discussed the meaning and nature of critical thinking; standards of critical thinking, codes of intellectual conduct: the principles of good arguments and critical thinking. With this as background, we are now in a position to offer general characteristics of critical thinking.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Appreciate the general characteristics of critical thinking.
- Understand the characteristics of a critical and uncritical thinker.

Activity # 1: *Dear learners, what do you think of the specific characteristics that best distinguishes critical individuals from those uncritical ones?*

Dear learners, we have defined critical thinking generally as a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims. What then distinguishes a critical thinker from the uncritical one? Let us discuss some characteristics of Critical and Uncritical Thinkers.

4.1 Basic Traits of Critical Thinkers

A critical thinker simply is a person who exhibit some feature of critical thinking. There are some dispositions and attitudes, skills and abilities, habits and values that every critical person should manifest. In this section, we will see some of the key intellectual traits of critical thinkers.

Critical thinkers:

- ✓ Are honest with themselves, acknowledging what they don't know, recognizing their limitations, and being watchful of their own errors.
- ✓ Regard problems and controversial issues as exciting challenges.

- ✓ Strive for understanding, keep curiosity alive, remain patient with complexity, and are ready to invest time to overcome confusion.
- ✓ Base judgments on evidence rather than personal preferences, deferring judgment whenever evidence is insufficient. They revise judgments when new evidence reveals error.
- ✓ Are interested in other people's ideas and so are willing to read and listen attentively, even when they tend to disagree with the other person.
- ✓ Recognize that extreme views (whether conservative or liberal) are seldom correct, so they avoid them, practice fair-mindedness, and seek a balance view.
- ✓ Practice restraint, controlling their feelings rather than being controlled by them, and thinking before acting.

4.2 Basic Traits of Uncritical Thinkers

We have in the previous section that every critical person manifests some dispositions and attitudes, skills and abilities, habits and values. What about the uncritical thinker? In this section, we will see some traits of uncritical thinkers.

Uncritical thinkers:

- ➢ Pretend they know more than they do, ignore their limitations, and assume their views are error-free.
- ➢ Regard problems and controversial issues as nuisances or threats to their ego.
- ➢ Are inpatient with complexity and thus would rather remain confused than make the effort to understand.
- ➢ Base judgments on first impressions and gut reactions. They are unconcerned about the amount or quality of evidence and cling to their views steadfastly.
- ➢ Are preoccupied with themselves and their own opinions, and so are unwilling to pay attention to others' views. At the first sign of disagreement, they tend to think, "How can I refute this?"
- ➢ Ignore the need for balance and give preference to views that support their established views.
- ➢ Tend to follow their feelings and act impulsively.

Let us now compare and contrasts the key intellectual traits of critical thinkers with the relevant traits of uncritical thinkers:

First, critical thinkers have a passionate drive for clarity, precision, accuracy, and other critical thinking standards while uncritical thinkers often think in ways that are unclear, imprecise, and inaccurate. In addition to this, critical thinkers are sensitive to ways in which critical thinking can be skewed by egocentrism, sociocentrism, wishful thinking, and other impediments, while uncritical thinkers often fall prey to egocentrism, sociocentrism, relativistic thinking, unwarranted assumptions, and wishful thinking.

Second, critical thinkers are skilled at understanding, analyzing, and evaluating arguments and viewpoints whereas uncritical thinkers often misunderstand or evaluate unfairly arguments and viewpoints. Moreover, critical thinkers reason logically, draw appropriate conclusions from evidence and data, while uncritical thinkers are illogical, and draw unsupported conclusions from these sources.

Third, critical thinkers are intellectually honest with themselves, acknowledging what they do not know and recognizing their limitations while uncritical thinkers pretend they know more than they do and ignore their limitations. Furthermore, critical thinkers listen open-mindedly to opposing points of view, welcome criticisms of beliefs and assumptions, whereas uncritical thinkers are closed-minded, and resist criticisms of beliefs and assumptions.

Fourth, critical thinkers base their beliefs on facts and evidence rather than on personal preferences or self-interests, while uncritical thinkers often base beliefs on mere personal preferences or self-interests. Again, critical thinkers are aware of the biases and preconceptions that shape the way they perceive the world, whereas uncritical thinkers lack awareness of their own biases and preconceptions.

Fifth, critical thinkers think independently and are not afraid to disagree with group opinion whereas uncritical thinkers tend to engage in “groupthink” uncritically following the beliefs and values of the crowd. Moreover, critical thinkers have the intellectual courage to face and assess

fairly ideas that challenge even their most basic beliefs whereas uncritical thinkers fear and resist ideas that challenge their basic beliefs.

Finally yet importantly, critical thinkers pursue truth, are curious about a wide range of issues and have the intellectual perseverance to pursue insights or truths despite obstacles or difficulties whereas uncritical thinkers are often relatively indifferent to truth and lack curiosity, tend not to persevere when they encounter intellectual obstacles or difficulties.

Lesson 5: Barriers to Critical Thinking

Lesson Overview

It is said that critical thinking' is a disciplined thinking that provide a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims; and governed by clear intellectual standards that can be used to identify a critical thinking from the uncritical. But if critical thinking is so important, why is it that uncritical thinking is so common? Why is it that so many people, including many highly educated and intelligent people, find critical thinking so difficult? The reasons are quite complex. In this lesson, we will discuss some of the problems that impede critical thinking. But we will limit our discussion to four of them: egocentrism, sociocentrism, unwarranted assumptions and stereotype and relativistic thinking. These are not exhaustive lists. There are many factors that impede critical thinking.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Identify and define the major barriers to critical thinking.

Activity # 1: *Dear learners, what do you think impede critical thinking?*

Dear learners, there are a number of factors that impede a critical thinking. Some of the most common barriers to critical thinking are: Lack of relevant background information, poor reading skills, bias, prejudice, superstition, egocentrism (self-centered thinking), sociocentrism (group-centered thinking), peer pressure, conformism, provincialism (narrow, unsophisticated thinking),

narrow-mindedness, closed-mindedness, distrust in reason, relativistic thinking, stereotyping, unwarranted assumptions, scapegoating (blaming the innocent), rationalization (inventing excuses to avoid facing our real motives).

Let us examine in detail five of these impediments that play an especially powerful role in hindering critical thinking: egocentrism, sociocentrism, unwarranted assumptions, relativistic thinking, and wishful thinking.

1) Egocentrism

One of the most powerful barriers to critical thinking is egocentrism. Even highly educated and intelligent people are prey to egocentrism. Egocentrism is the tendency to see reality as centered on oneself. Egocentrics are selfish, self-absorbed people who view their interests, ideas, and values as superior to everyone else's. All of us are affected to some degree by egocentric biases. Egocentrism can manifest itself in a variety of ways. Two common forms this are *self-interested thinking* and *the superiority bias*.

Self-interested thinking is the tendency to accept and defend beliefs that harmonize with one's self-interest. Almost no one is immune to self-interested thinking. There are a number of facts, which supported this idea. For example, most doctors support legislation making it more difficult for them to be sued for malpractice because they do not want to punish for mistakes committed in the workplace. Most university professors strongly support tenure, paid sabbaticals, low teaching loads, and a strong faculty voice in university governance because these will promote their interest. Most factory workers support laws requiring advance notice of plant closings; most factory owners do not. Of course, some of these beliefs may be supported by good reasons. From a psychological standpoint, however, it is likely that self-interest plays at least some role in shaping the respective attitudes and beliefs.

Self-interested thinking, however understandable it may seem, is a major obstacle to critical thinking. Everyone finds it tempting at times to reason that "this benefits me, therefore it must be good"; but from a critical thinking standpoint, such "reasoning" is a sham. Implicit in such thinking is the assumption that "What is most important is what *I* want and need." But why should I, or

anyone else, accept such an arbitrary and obviously self-serving assumption? What makes your wants and needs more important than everyone else's?

Critical thinking condemns such special pleading. It demands that we weigh evidence and arguments objectively and impartially. Ultimately, it demands that we revere truth - even superiority bias (also known as illusory superiority or the better-than average effect) is the tendency to overrate oneself - to see oneself as better in some respect than one actually is. If you are like most people, you probably think of yourself as being an unusually self-aware person who is largely immune from any such self-deception. If so, then you too are probably suffering from superiority bias - when it hurts.

2) Sociocentrism

The second powerful barrier that paralyze the critical thinking ability of most people including intellectuals is sociocentrism. It is group-centered thinking. Just as egocentrism can hinder rational thinking by focusing excessively on the self, so sociocentrism can hinder rational thinking by focusing excessively on the group. Sociocentrism can distort critical thinking in many ways. Two of the most important are group bias and conformism.

Group bias is the tendency to see one's own group (nation, tribe, sect, peer group, and the like) as being inherently better than others. Social scientists tell us that such thinking is extremely common throughout human history and across cultures. Just as we seem naturally inclined to hold inflated views of ourselves, so we find it easy to hold inflated views of our family, our community, or our nation. Conversely, we find it easy to look with suspicion or disfavor on those we regard as "outsiders"

Most people absorb group bias unconsciously, usually from early childhood. It is common, for example, for people to grow up thinking that their society's beliefs, institutions, and values are better than those of other societies. Although most people outgrow nationalistic biases to some extent, few of us manage to outgrow them completely. Clearly, this kind of "mine-is-better" thinking lies at the root of a great deal of human conflict, intolerance, and oppression.

Conformism refers to our tendency to follow the crowd - that is, to conform (often unthinkingly) to authority or to group standards of conduct and belief. The desire to belong, to be part of the in-group, can be among the most powerful of human motivations. This desire can seriously cripple our powers of critical reasoning and decision-making.

Authority moves us. We are impressed, influenced, and intimidated by authority, so much so that, under the right conditions, we abandon our own values, beliefs, and judgments, even doubt our own immediate experience. As critical thinkers, we need to be aware of the seductive power of peer pressure and reliance on authority and develop habits of independent thinking to combat them.

3) Unwarranted Assumptions and Stereotypes

The third factor that impedes critical thinking is unwarranted assumptions and stereotype. An assumption is something we take for granted - something we believe to be true without any proof or conclusive evidence. Almost everything we think and do is based on assumptions. If the weather report calls for rain, we take an umbrella because we assume that the meteorologist is not lying, that the report is based on a scientific analysis of weather patterns, that the instruments are accurate, and so forth. There may be no proof that any of this is true, but we realize that it is wiser to take the umbrella than to insist that the weather bureau provide exhaustive evidence to justify its prediction.

Although we often hear the injunction "Don't assume," it would be impossible to get through a day without making assumptions; in fact, many of our daily actions are based on assumptions we have drawn from the patterns in our experience. You go to class at the scheduled time because you assume that class is being held at its normal hour and in its same place. You don't call the professor each day to ask if class is being held; you just assume that it is. Such assumptions are warranted, which means that we have good reason to hold them. When you see a driver coming toward you with the turn signal on, you have good reason to believe that the driver intends to turn. You may be incorrect, and it might be safer to withhold action until you are certain, but your assumption is not unreasonable.

Unwarranted assumptions, however, are unreasonable. An unwarranted assumption is something taken for granted without good reason. Such assumptions often prevent our seeing things clearly.

One of the most common types of unwarranted assumptions is a stereotype. The word stereotype comes from the printing press era, when plates, or stereotypes, were used to produce identical copies of one page. Similarly, when we stereotype, as the word is now used, we assume that individual people have all been stamped from one plate, so all politicians are alike, members of ethnic groups, professors, women, teachers, and so forth. When we form an opinion of someone that is based not on his or her individual qualities but, rather, on his or her membership in a particular group, we are assuming that all or virtually all members of that group are alike. Because people are not identical, no matter what race or other similarities they share, stereotypical conceptions will often be false or misleading.

Typically, stereotypes are arrived at through a process known as hasty generalization, in which one draws a conclusion about a large class of things(in this case, people) from a small sample. If we meet one South African who talk a lot, we might jump to the conclusion that all South Africans talk a lot. Or we might generalize from what we have heard from a few friends or reading a single news story. Often the media advertisements, the news, movies, and so forth encourage stereotyping by the way they portray groups of people.

The assumptions we need to become most conscious of are not the ones that lead to our routine behaviors, such as carrying an umbrella or going to class, but the ones on which we base our more important attitudes, actions, and decisions. If we are conscious of our tendency to stereotype, we can take measures to end it.

4) Relativistic Thinking

One of the strongest challenges to critical thinking is relativistic thinking. Relativism is the view that truth is a matter of opinion. There are two popular forms of relativism: *subjectivism* and *cultural relativism*. Subjectivism is the view that truth is a matter of individual opinion. According to subjectivism, whatever an individual believes is true, *is* true for that person, and there is no such thing as “objective” or “absolute” truth, i.e., truth that exists independent of what anyone believes. For example, suppose Abdella believes that abortion is wrong and Obang believes that abortion is not always wrong. According to subjectivism, abortion is always wrong for Abdella and not always

wrong for Obang. Both beliefs are true – *for* them. And truth for one individual or another is the only kind of truth there is.

The other common form of relativism is cultural relativism. This is the view that truth is a matter of social or cultural opinion. In other words, cultural relativism is the view that what is true for person A is what person A's culture or society believes is true. Drinking wine, for example, is widely considered to be wrong in Iran but is not generally considered to be wrong in France. According to cultural relativism, therefore, drinking wine is immoral in Iran but
is morally permissible in France. Thus, for the cultural relativist, just as for the subjectivist, there is no objective or absolute standard of truth. What is true is whatever most people in a society or culture believe to be true.

Relatively few people endorse subjectivism or cultural relativism in the pure, unqualified forms in which we have stated them. Almost everybody would admit, for example, that 1 + 1 = 2 is true, no matter who might be ignorant or deluded enough to deny it. What relativists usually claim, therefore, is not that all truth is relative, but that truth is relative in some important domain(s).

By far the most common form of relativism is *moral relativism.* Like relativism generally, moral relativism comes in two major forms: *moral subjectivism* and *cultural moral relativism*. Moral subjectivism is the view that what is morally right and good for an individual, A, is whatever A believes is morally right and good. Thus, if G/Meskel believes that premarital sex is always wrong, and Eden believes that it is not always wrong; according to moral subjectivism, premarital sex is always wrong for G/Meskel and is not always wrong for Eden.

The other major form of moral relativism is cultural moral relativism, the view that what is morally right and good for an individual, A, is whatever A's society or culture believes is morally right and good. Thus, according to cultural moral relativism, if culture A believes that polygamy is wrong, and culture B believes that polygamy is right, then polygamy is wrong for culture A and right for culture B. Cultural moral relativism is a very popular view. There are two major reasons people seem to find it so attractive. One has to do with the nature of moral disagreement and the other concerns the value of tolerance.

Ethics, obviously, is very different from mathematics or science. In mathematics and science, there are arguments and disagreements, but not nearly to the extent there are in ethics. In ethics there is widespread disagreement, the disagreements often go very deep, and there seems to be no rational way to resolve many of them. What this shows, some people conclude, is that there is no objective truth in ethics; morality is just a matter of individual or societal opinion.

Another reason people find cultural moral relativism attractive is that it seems to support the value of tolerance. Throughout history, terrible wars, persecutions, and acts of religious and cultural imperialism have been perpetrated by people who firmly believed in the absolute righteousness of their moral beliefs and practices. Cultural moral relativism seems to imply that we must be tolerant of other cultures' moral beliefs and values. If culture A believes that polygamy is wrong, and culture B believes that it is right, then culture A must agree that polygamy is right for culture B, no matter how offensive the practice may be to culture A.

Despite these apparent attractions, however, there are deep problems with cultural moral relativism. First, does the fact that there is deep disagreement in ethics show that there is no objective moral truth - that ethics is just a matter of opinion? Think about another area in which there is deep, pervasive, and seemingly irresolvable disagreement: religion. People disagree vehemently over whether God exists, whether there is an afterlife, and so forth; yet we do not conclude from this that there is no objective truth about these matters. It may be difficult to know whether God exists. But whether he exists is not simply a matter of opinion. Thus, deep disagreement about an issue does not show that there is no objective truth about that issue.

Second, cultural moral relativism does not necessarily support the value of tolerance. Relativism tells us that we should accept the customs and values of our society. Thus, if you live in an intolerant society, relativism implies that you too should be intolerant. Does this mean that cultural moral relativism has nothing at all to teach us? No. The fact that people disagree so much about ethics does not show that moral truth is simply a matter of opinion, but it should make us cautious and open-minded regarding our own ethical beliefs. If millions of obviously decent, intelligent people disagree with you, how can you be sure that your values are the correct ones?

In this way, relativism can teach us an important lesson about the value of intellectual humility. But we do not need relativism - which is a false and confused theory - to teach us this lesson. We can learn it just by opening our hearts and minds and thinking critically about the challenges of living an ethical life.

5) Wishful Thinking

Wishful thinking refers to a state of believing something not because you had good evidence for it but simply because you wished it were true. Have you ever been guilty of wishful thinking? If so, you are not alone. Throughout human history, reason has done battle with wishful thinking and has usually come out the loser. People fear the unknown and invent comforting myths to render the universe less hostile and more predictable. They fear death and listen credulously to stories of healing crystals, quack cures, and communication with the dead. They fantasize about possessing extraordinary personal powers and accept uncritically accounts of psychic prediction and levitation,

Lesson 6: Benefits of Critical Thinking

Lesson Overview

Being a critical person in general and critical thinking in particular has many benefits. In this lesson, we will discuss some benefits of critical thinking.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Identify the major benefits of critical thinking.

Activity # 1: *Dear learners, what benefits of critical thinking do you think of?*

Critical Thinking: Skills and Dispositions

Critical thinking teaches you how to raise and identify fundamental questions and problems in the community. It will teach you to reformulate these problems clearly and precisely. It will teach you how to gather and assess relevant information, develop reasoned conclusions and solutions, testing them against relevant criterion and standards. It teaches you how to be open minded to alternative system of thought, recognize and assess your own assumptions, implications and practical consequences, how to communicate effectively with others in figuring out solutions to complex problems.

Critical thinking is what university is all about. University is not only about teaching students with facts. It's about teaching students to think- think critically. This chapter will introduce you the skills and dispositions you need to become an independent, self-directed thinker and learner. But you'll only get out of this course what you put into it. Becoming a critical thinker is hard work. Becoming a master thinker means toning up your mental muscles and acquiring habits of careful, disciplined thinking. This requires effort, and practice. Critical thinking is an adventure. Becoming mentally fit is hard work. But in the end you'll be a smarter, stronger, more confident thinker. Let us consider, more specifically, what you can expect to gain from a course in critical thinking.

Critical Thinking in the Classroom

When they first enter university, students are sometimes surprised to discover that university education seem less interested in how beliefs are acquired than they are in whether those beliefs can withstand critical scrutiny. The question is not much about what you know, but how you acquire what you know and whether your ideas stands critical examination.

In university, the focus is on higher-order thinking: the active, intelligent evaluation of ideas and information. For this reason critical thinking plays a vital role in universities. In a critical thinking chapter, students learn a variety of skills that can greatly improve their classroom performance. These skills include:

- Understanding the arguments and beliefs of others
- Critically evaluating those arguments and beliefs

- Developing and defending one's own well-supported arguments and beliefs

Let us look briefly at each of these three skills:

To succeed in university, you must, of course, be able to understand the material you are studying. A course in critical thinking cannot make inherently difficult material easy to grasp, but critical thinking does teach a variety of skills that, with practice, can significantly improve your ability to understand the arguments and issues discussed in your college textbooks and classes.

In addition, critical thinking can help you critically evaluate what you are learning in class. During your university career, your instructors will often ask you to discuss "critically" some argument or idea introduced in class. Critical thinking teaches a wide range of strategies and skills that can greatly improve your ability to engage in such critical evaluation.

You will also be asked to develop your own arguments on particular topics or issues. In moral and civic education class, for example, you might be asked to write a paper addressing the issue of whether ethnic federalism is good or bad. To write such a paper successfully, you must do more than simply find and assess relevant arguments and information. You must also be able to marshal arguments and evidence in a way that convincingly supports your view. The systematic training provided in a course in critical thinking can greatly improve that skill as well.

Critical thinking is a transferable thinking skill. These skills will be taught in ways that expressly aim to facilitate their transfer to other subjects and contexts. If you learn how to structure argument, judge the credibility of sources or make a reasonable decision by the methods of critical thinking for instance, it will not be difficult to see how to do these things in many other contexts such as in class rooms and personal life; this is the sense in which the skills we teach in this text are transferable.

Critical Thinking in Life

Critical thinking is valuable in many contexts outside the classroom. Let us look briefly at three ways in which this is the case. First, critical thinking can help us avoid making foolish personal decisions. All of us have at one time or another made decisions about what profession to choose, what relationships to enter into, what personal behavior to develop, and the like that we later realized were seriously misguided or irrational. Critical thinking can help us avoid such mistakes by teaching us to think about important life decisions more carefully, clearly, and logically.

Second, critical thinking plays a vital role in promoting democratic processes. In democracy, it is the people who have the ultimate say over who governs and for what purposes. Citizens should vote, should evaluate different public policies, and collectively determine their fate and et cetera. It is vital, therefore, that citizens' decisions be as informed and as rational as possible. Many of today's most serious societal problems - environmental destruction, poverty, ethnic conflicts, decaying the morality of societies, high level of corruption , violating basic human rights, displacement, to mention just a few - have largely been caused by poor critical thinking.

Third, critical thinking is worth studying for its own sake, simply for the personal enrichment it can bring to our lives. One of the most basic truths of the human condition is that most people, most of the time, believe what they are told. Throughout most of recorded history, people accepted without question that the earth was the centre of the universe, that demons cause disease that slavery was just, and that women are inferior to men. Critical thinking, honestly and courageously pursued can help free us from the unexamined assumptions and biases of our upbringing and our society. It lets us step back from the prevailing customs and ideologies of our culture and ask, "This is what I've been taught, but is it true? In short, critical thinking allows us to lead self-directed, "examined" lives. Such personal liberation is, as the word itself implies, the ultimate goal of education. Whatever other benefits it brings, education can have no greater reward.

Chapter Summary

Critical also means, "involving or exercising skilled judgment or observation." In this sense, critical thinking means thinking clearly and intelligently. More precisely, critical thinking is the general term given to a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims; to discover and overcome personal preconceptions and biases; to formulate and present convincing reasons in support of conclusions; and to make reasonable, intelligent decisions about what to believe and what to do.

It does not automatically follow that being intelligent means the student can think critically or reason about information in a useful, effective and efficient manner. Critical thinking is a process. It is, also, a journey that helps us to arrive at the most useful, helpful, and most likely destinations when evaluating claims for scientific truth. Critical thinking, thus, is thinking clearly, thinking fairly, thinking rationally, thinking objectively, and thinking independently. It is a process that hopefully leads to an impartial investigation of the data and facts that remains not swayed by irrelevant emotions. As part and parcel of logic, critical thinking ,also, teaches us what logical principles we, as rational beings, should following in right reasoning. It is also important to recall that, in this chapter, characteristics of critical and uncritical persons, criteria for critical thinking, what it meant for a good argument and other related issues were addressed.

Self Check Exercise

1. Define critical thinking.

_____

2. Discuss the major standards of critical thinking.

_____

3. Explain the principles of good argument and critical thinking.

_____

4. Compare and contrast critical and uncritical thinkers.

_____

5. Explain the common barriers of critical thinking.

_____

6. Discuss briefly the major benefits of critical thinking.

_____

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CHAPTER FIVE

LOGICAL REASONING AND FALLACIES

Chapter Overview

We have seen in chapter two that an argument can be good or bad, depending on the relationship between the premises and a conclusion. An argument is good as far as it meets all the general criteria set for a good argument. If, however, it fails to do so, or violates them, it becomes bad, and hence, fallacious. A fallacy is, therefore, a defect in an argument (or, a mistake frequently committed in reasoning) that consists in something other than merely false premises. It can be committed in many ways, but usually it involves either a mistake in reasoning or the creation of some illusion that makes a bad argument appear good (or both). That is, a fallacy is often committed because of the problem in the reasoning process or the form of the argument, or defects in the contents of the statements used as premises or a conclusion. For that matter, both deductive and inductive arguments may contain fallacies.

Depending on the kind of the problems or defects they contain, (i.e., the problems or defects that make them fallacious), arguments may commit either a formal or an informal fallacy. As a result, they are often grouped in two: *Formal fallacies* and *informal fallacies*. If an argument contains a structural defect or problem and violates the standard form of a good argument because of that, it commits a formal fallacy. Because the defect that causes it is structural, a formal fallacy may be identified through mere inspection of the form or structure of an argument. Fallacies of this kind are found only in deductive arguments that have identifiable forms. If, however, the defect of a certain argument goes far beyond a structural problem and attacks the very content of the argument, then that particular argument commits an informal fallacy. Because they have the ability to hide their true argumentative forms, informal fallacies cannot be identified through mere inspection of the form or structure of an argument. Only a detail analysis to be applied on the content of an argument can reveal the source of the trouble.

Dear learner, in this chapter, we will learn the nature and major forms of fallacies, with a special emphasis on the categories of informal fallacies. We will see, first, fallacies in general as an introductory move, but we will invest most of our time on the varieties of informal fallacies.

Chapter Objectives:

At the end of this chapter, you will be able to:

- Define what a fallacy is in general.
- Differentiate formal and informal fallacies.
- Identify the defects of fallacious arguments.
- Recognize the major categories and varieties of informal fallacies.
- Identify the particular fallacy committed in a certain argument.

Lesson 1: Fallacy in General

Lesson overview:

Fallacy is generally defined as a deficiency or logical problem that occurs in an argument for various reasons, other than merely false premises. It can be committed in different forms, depending on the particular defect of an argument. In this lesson, we will discuss fallacy in general: the general meaning of fallacy, the formal and informal types of fallacies.

Lesson objectives:

At the end of this lesson, you are expected to be able to:

- Define fallacy.
- Differentiate formal and informal fallacies.

1.1 The Meaning of Fallacy

Activity # 1: *Dear learners, are you familiar with the term 'fallacy'? Have you ever used the term for any purpose? If so, what do you mean by 'fallacy'?*

Dear learners, the word 'fallacy' is a general term that refers to a logical defect or flaw or fault that a certain argument exhibits in its structural arrangement or reasoning process, or in the contents of its statements used as premises or a conclusion, for various reasons, other than merely false premises. In general, it is a violation of standard argumentative rules or criteria. Let us take a moment now and see the standard criteria or rules of a good argument, before proceed to the detail discussion of fallacies.

Activity # 2: *Dear learners, what are the standard rules of a good argument?*

There are four general criteria of a good argument, which specifically evaluate the *relevance*, *acceptability*, *sufficiency*, and *rebuttablity* of the premises. A good argument must have premises that: are ***relevant*** to the truth of the conclusion, are ***acceptable*** to a logical person, together constitute ***sufficient grounds*** for the truth of the conclusion, and anticipate and provide an ***effective rebuttal*** to all reasonable challenges to the argument or to the position supported by it. A premise is relevant**,** if its acceptance provides some reason to believe, counts in favor of, or makes a difference to the truth or falsity of the conclusion. Otherwise, it is irrelevant. A premise is acceptable, if it is a reason, that the skeptic is likely to accept, or that a rational person is ought to accept, or agreed on. However, an argument may not be good, even though its premises may be relevant and acceptable, unless they are sufficient enough in number, kind and weight. Finally, a good argument should also provide an effective rebuttal (refutation, or disproof) to the strongest arguments against one's conclusion and also perhaps to the strongest arguments in support of the alternative position. Therefore, fallacy is the violation of one or more of these criteria of a good argument. That is, an argument is good as far as it meets all the general criteria set for a good argument, and hence commits no fallacy. It, however, becomes bad, if it violates any one of them, and hence fallacious.

Fallacies can be committed in many ways, but usually it involves either a mistake in reasoning or the creation of some illusion that makes a bad argument appear good (or both). They are often committed because of the problem in the reasoning process or the form of the argument, or defects in the contents of the statements used as premises or a conclusion. For that matter, both deductive and inductive arguments may contain fallacies; if they do, they are either unsound or uncogent, depending on the kind of argument. Conversely, if an argument is unsound or uncogent, it has one or more false premises or it contains a fallacy (or both).

1.2 Types of Fallacies

Fallacies are usually divided into two groups: formal and informal. Depending on the kind of the problems or defects they contain, (i.e., the problems or defects that make them fallacious), arguments may commit either a formal or an informal fallacy. A fallacy committed due to a structural defect of argument is known as a ***formal fallacy***. Because the problem that causes them is a structural defect, formal fallacies may be identified through mere inspection of the form or structure of an argument. An ***informal fallacy***, on the other hand, is a fallacy, which is committed due to a defect in the very content of an argument, other than in its structure of form. Because they have the ability to hide their true argumentative forms, informal fallacies cannot be identified through mere inspection of the form or structure of an argument. Only a detail analysis to be applied on the content of an argument can reveal the source of the trouble.

Formal fallacies are found only in deductive arguments that have identifiable forms, such as *categorical syllogisms, disjunctive syllogisms,* and *hypothetical syllogisms*. The following categorical syllogism contains a formal fallacy:

All tigers are animals.
All mammals are animals.
Therefore, all tigers are mammals.

This argument has the following form:

All A are B.
All C are B.

All A are C.

Through mere inspection of this form, one can see that the argument is invalid. The fact that A, B,

and C stand respectively for ‘‘tigers,’’ ‘‘animals,’’ and ‘‘mammals’’ is irrelevant in detecting the fallacy. The problem may be traced to the second premise. If the letters C and B are interchanged, the form becomes valid, and the original argument, with the same change introduced, also becomes valid (but unsound).

Here is an example of a formal fallacy that occurs in a hypothetical syllogism:

If apes are intelligent, then apes can solve puzzles.
Apes can solve puzzles.
Therefore, apes are intelligent.

This argument has the following form:

If A, then B.
B.

A.

This type of fallacy is called *affirming the consequent*. In this case, if A and B are interchanged in the first premise, the form becomes valid, and the original argument, with the same change, also becomes valid. In this case, if A and B are interchanged in the first premise, the form becomes valid.

In distinguishing formal from informal fallacies, remember that formal fallacies occur only in deductive arguments. Thus, if a given argument is inductive, it cannot contain a formal fallacy. Also, keep an eye out for standard deductive argument forms such as categorical syllogisms and hypothetical syllogisms. If such an argument is invalid because of an improper arrangement of terms or statements, it commits a formal fallacy.

Informal fallacies

Informal fallacies are those mistakes in reasoning process of an argument that cannot be recognized by analyzing the structure of an argument, but only through analysis of the content of the argument. Only the meaning of the words, how the statements are constructed and how inferences are made that reveals the faulty reasoning. Consider the following example:

All factories are plants.
All plants are things that contain chlorophyll.
Therefore, all factories are things that contain chlorophyll.

A cursory inspection of this argument might lead one to think that it has the following form:

All A are B.
All B are C.

All A are C.

Since this form is valid, one might conclude that the argument itself is valid. Yet the argument is clearly invalid because it has true premises and a false conclusion. An analysis of the content- that is, the meaning of the words- reveals the source of the trouble. The word ‘‘plants’’ is used in two different senses. In the first premise it means a building where something is manufactured, and in the second it means a life form. Thus, the argument really has the following invalid form:

All A are B.
All C are D.

All A are D.

Since the time of Aristotle, logicians have attempted to classify the various informal fallacies. Aristotle himself identified thirteen and separated them into two groups. The work of subsequent logicians has produced dozens more, rendering the task of classifying them even more difficult. The presentation that follows divides twenty-two informal fallacies into five groups: fallacies of relevance, fallacies of weak induction, fallacies of presumption, fallacies of ambiguity, and fallacies of grammatical analogy.

Lesson 2: Fallacies of Relevance

Lesson overview:

Fallacies of relevance are those, (except missing the point) which are committed chiefly due to a provision premises that are logically irrelevant to the conclusion. Unlike the others, the fallacy of missing the point is committed due to an irrelevant conclusion. In this lesson, we will discuss eight fallacies of relevance: Appeal to force, Appeal to pity, Appeal to people, Argument against the person, Accident, Straw man, Missing the point, and Red Herring.

Lesson objectives:

At the end of this lesson, you will be able to:

- Recognize the varieties of fallacies of relevance.
- To identify the particular fallacy of relevance committed in a certain argument.

Activity # 1: *Dear learners, do you remember the principle of relevance we have discussed in the previous chapter? Do you relate the principle of relevance with the fallacy of relevance?*

The fallacies of relevance share the common characteristic- that the arguments, in which they occur, have premises that are logically irrelevant to the conclusion. Yet the premises are relevant psychologically, so the conclusion may seem to follow from the premises, even though it does not follow logically. In a good argument the premises provide genuine evidence in support of the conclusion. In an argument that commits a fallacy of relevance, on the other hand, the connection between premises and conclusion is emotional. Such arguments are often called *non sequiturs*, which means that the conclusion does not seem to follow from the premises. They are also sometimes called *argumentative leaps*, which suggest that since no connection is seen between the premises and the conclusion, a huge leap (jump) would be required to move from one (the premises) to the other (the conclusion). To identify a fallacy of relevance, therefore, one must be able to distinguish genuine evidence from various forms of emotional appeal.

1) *Appeal to Force (Argumentum ad Baculum: Appeal to the ‘‘Stick’’)*

Activity # 2: *Dear learners, how do you define the fallacy of appeal to force?*

The first type of fallacy of relevance is appeal to force. It occurs when an arguer poses a conclusion to another person and tells that person either implicitly or explicitly that some harm will come to him if he does not accept the conclusion. In other words it occurs when a conclusion defended by a threat to the well- being of those who do not accept the conclusion.

This fallacy always involves a threat by the arguer to the physical or psychological well- being of the listener. But this threat is logically irrelevant to the subject matter of the conclusion even though it seems psychologically relevant. Consider the following argument in which the arguer uses unjustified physical threat on the listeners.

Mr. Kebde you accused me of fraud and embezzlements. You have to drop the charge you filed against me. You have to remember that I am your ex-boss; I will torture both you and your family members if you do not drop your case. Got it?

This is a fallacious argument; the arguer is threatening the listener to abandon his charge. The above argument can be re-written to expose the faulty reasoning most clearly.

Mr. Kebede you have to drop your charge, otherwise you will face accident.

You can see that the conclusion is supported by force. The threat “accident” has no logical bearing on the conclusion however (*you have to drop your charge*).

Appeal to force need not use sheer physical force to support a certain conclusion. Consider the following argument.

Lately there has been a lot of negative criticism of our policy on dental benefits. Let me tell you something, people. If you want to keep working here, you need to know that our policy is fair and reasonable. I won’t have anybody working here who doesn’t know this.

Now this is a blatant example, which shows an explicit use of psychological force to impose a conclusion. The arguer is trying to impose the conclusion that you (workers) should accept the dental benefit policy as fair and reasonable. The reason given however does not support the conclusion. It says that 'any worker who does not accept this conclusion would be fired.' But a threat to loss a job cannot constitute a reason to support the proposition that the dental policy is reasonable and fair. Thus, it is unjustified appeal to force. Such kinds of argument have the following form:

Premise: You can avoid harm by accepting the conclusion that the policy is fair and reasonable.
Conclusion: Thus, the policy is fair and reasonable.

The appeal to force fallacy usually accomplishes its purpose by psychologically impeding the reader or listener from acknowledging a missing premise that, if acknowledged, would be seen to be false or at least questionable. Finally, a note of caution: The fact that an argument mentions a threat does not necessarily make it a fallacy.

2) *Appeal to Pity (Argumentum ad Misericordiam)*

Activity # 3: *Dear learners, how do you define the fallacy of appeal to pity?*

The second type of fallacy relevant is appeal to pity. The appeal to pity (or ad misericordiam fallacy) is the attempt to support a conclusion merely by evoking pity in one's audience when the statements that evoke the pity are logically unrelated to the conclusion. The appeal to pity is not, generally speaking, very subtle. But if the arguer succeeds in evoking sufficiently strong feelings of pity, he or she may distract the audience from the logic of the situation and create a desire to accept the conclusion. The appeal to pity fallacy has the following form.

Premises: You have reason to pity this person, thing or situation (or group).
Conclusion: You should do X for the benefit of this person (or group), although doing X is not called for logically by the reason given.

Consider the following argument.

The Headship position in the department of accounting should be given to Mr. Oumer Abdulla. Oumer has six hungry children to feed and his wife desperately needs an operation to save her eyesight.

The conclusion of this argument is "the Headship position in the department of accounting should be given to *Oumer Abdulla*". But the conclusion is not logically relevant to the pathetic condition of the arguer though they do psychologically. It may be pitiful to see people under these conditions; but this does not mean that such conditions are logically relevant in every situation to decide. A certain position should be open to people to fill when they have the necessary qualification. The relevant logical reason in this situation for *Oumer Abdulla* to qualify for the position is if he fulfills the necessary educational experience. But 'he has six hungry children to feed and his wife needs operation' does not lend reason to accept the conclusion. So this is illegitimate appeal to pity.

There is a tendency to take argument from pity as inherently fallacious. But this is not always the case. There are arguments from pity, which are reasonable and plausible. There are situations where compassion or sympathy could be a legitimate response for some situations.

Most society values helping people in time of danger; showing compassion and sympathy is a natural response in some situation. If some group of people are in danger, helping out may require appeal to the compassion or pity of other people. Consider the following argument.

Twenty children survive earthquakes that kill most people in the village. These children lost their parents. They are out of school, and home in the street. Unless we each of us contribute money their life will be in danger in the coming days. We should help these children as much as we can.

As you can see this is argument from compassion, in which the conclusion is based on the feeling of sympathy. The natural response of compassion and pity is a legitimate and reasonable response. These children deserve special consideration or compassion; they deserve help from the community. One of the main reasons for this deservingness is that the situation in which they found themselves in is due to factor beyond their control. They are not responsible for the situation in

which they are in. If people are not responsible for the situation in which they are in; it is perfectly reasonable and sensible to show compassion for these people.

In fact, this is the main justification for some social policies to help out old people, disables, orphan and other people who are in bad situation due to factor which is beyond their control. Helping people in problem when they are not responsible is reasonable. But if the people are in bad situation in which they are responsible as a cause, showing of compassion may be illegitimate and argument in which the conclusion is depend on illegitimate appeal to compassion is a fallacy - appeal to pity fallacy.

3) Appeal to the People (Argumentum ad Populum)

Activity # 4: *Dear learners, how do you define the fallacy of appeal to people?*

Nearly everyone wants to be loved, esteemed, admired, valued, recognized, and accepted by others. Feeling of being part of community and belongingness are some of the most important humans needs. The appeal to the people strikes these desires and needs to get acceptance for conclusion. Or the appeal to the people (or ad populum fallacy) is an attempt to persuade a person (or group) by appealing to these desires and needs. Consider the following argument.

I look out at you all, and I tell you, I am proud to be here. Proud to belong to a party that stands for what is good for the country. Proud to cast my lot with the kind of people who make this nation great. Proud to stand with men and women who can get our nation back on its feet. Yes, there are those who criticize us, who label our view of trade agreements as "protectionist." But when I look at you hard-working people, I know we're right and the critics are wrong.

The speaker wants the audience to accept his conclusion that 'the trade agreement is not a protectionist'. But look how he supports his thesis. He appeals to the emotions of the crowd, the strong feelings of the crowd, however, do not lend logical support to anyone's view about trade agreements. Premises to the effect that "I am proud to be associated with you" and "you are hard-working people" are irrelevant to the conclusion (that "our view of trade agreements is right"). As

you can see, the arguer uses the feeling of individuals to be part of the group to accept his conclusion. And anyone who wants to be part of the group, who does not want to be deviated from the mob mentality, accepts the conclusion as true.

However, one does not have to be addressing a large group to commit the ad populum fallacy. Any attempt to convince by appealing to the need for acceptance (or approval) from others counts as an ad populum fallacy. Consider the following argument.

Mrs. Riley, are you saying that President Bush made a moral error when he decided to go to war with Iraq? I can't believe my ears. That's not how Americans feel. Not true Americans, anyway. You are an American, aren't you, Mrs. Riley?

The mere fact that Ms. Riley is an American provides her with no logical support for the conclusion that America's war with Iraq was just or moral. But like most Americans, Ms. Riley may wish to avoid being regarded as unpatriotic, and so an appeal to the people may influence her thinking.

Two approaches are involved in appeal to people fallacy: *direct* and i*ndirect*. The direct approach occurs when an arguer, addressing a large group of people, excites the emotions and enthusiasm of the crowd to win acceptance for his or her conclusion. The objective is to arouse a kind of mob mentality. This is the strategy used by nearly every propagandist and demagogue. Because the individuals in the audience want to share in the camaraderie, the euphoria, and the excitement, they find themselves accepting any number of conclusions with ever-increasing fervor.

In the indirect approach, the arguer aims his or her appeal not at the crowd as a whole but at one or more individuals separately, focusing on some aspect of their relationship to the crowd. The indirect approach is very common in most advertising industries. There are three recognizable forms in indirect approach: *Bandwagon, Vanity,* and *Snobbery*.

I. Bandwagon fallacy

Bandwagon fallacy is a kind of fallacy that commonly appeals to the desire of individuals to be considered as part of the group or community in which they are living. One of the characteristics of community or group is that they share some values and norms. Not only they share but also every individual are expected to manifest group conformity to these shared values. Bandwagon fallacy just uses these emotions and feelings to get acceptance for a certain conclusion. For instance, consider the following example.

The majority of people in Ethiopia accept the opinion that child circumcision is the right thing to do. Thus, you also should accept that child circumcision is the right thing to do.

This argument presents appeal to bandwagon and if the person considers that child circumcision is the right thing to do because the majority of people accepts it, then this argument commits the fallacy of bandwagon.

Dear learners, do you see any relationship between sociocentrism and bandwagon fallacy?

II. Appeal to Vanity

The **appeal to vanity** often associates the product with someone who is admired, pursued, or imitated, the idea being that you, too, will be admired and pursued if you use it. For example, BBC may show the famous footballer, Frank Lampard, wearing Addidas shoe, and says:

> *Wear this new fashion shoe! A shoe, which is worn only by few respected celebrities! ADIDDAS SHOE!!!*

The message is that if you wear the shoe, then you, too, will be admired and respected, just like the famous footballer, Frank Lampard.

III. Appeal to Snobbery Fallacy

Before discussing about snobbery fallacy, let us look into the meaning of snob. Snob means a person who admires people in higher classes too much and has no respect for people in the lower

classes or a person who thinks individuals from higher social classes are much better than other people because they like things many people do not like.

Appeal to snobbery fallacy is based on this desire to be regarded as superior to others. This fallacy appeal individuals and their desires to be regarded as different and better. Consider the following argument.

The newly produced Gebeta Guder wine is not for everyone to drink. But you are different from other people, aren't you? Therefore, the newly produced Gebeta Guder wine is for you.

As you can see, it is a kind of advertisement and it appeal to the desire of, particularly of those who are most famous and successful people, to be different from the mass; it appeals their desire to be different from the demos. And if the individuals want to be part of those who perceive themselves as different from the mass, then he can easily be cheated by this advertisement.

Are all appeal to people arguments inherently fallacious? Not all appeal to people arguments are inherently fallacious. There are arguments from people, which are plausible, and it is reasonable and safe to accept the conclusion as good. Consider the following argument.

It is generally accepted by those who live in and around polar region that penguin give birth to their children when the winter getting stronger. Thus, most probably penguin gives birth to their children when the winter is getting stronger.

The implicit assumption that makes this appeal to popular opinion plausible is that since the people who live in and around polar region are normally familiar with the area, they may be assumed to be in a position to know whether penguin give a birth when the winter become stronger or not. Therefore, if the people who live in and around polar region think that penguin give birth when the winter becomes stronger, it is a plausible and reasonably safe assumption (in the absence of any evidence to the contrary) that penguin give birth when the winter gets stronger.

In still other cases, the argument from popular opinion is based not on a position to know argument but on an assumption that people have deliberated on a particular policy or practice and have come

to accept it because they have found it a useful or good thing to do. Consider the following argument concerning killing of human being:

Everyone in society should accept the proposal that killing of human being, at least within one's own community, is wrong. The right to life is an important right in which all other rights are based. The right to life is one of the basic rights in all societies, and almost all societies accept as an important element of moral and legal law. Thus, the right to life should be considered as an established moral principle that has some weight of practical justification as a policy.

Here, the assumption is that people have generally accepted the right to life and even codified it in their systems of ethics. Such popular acceptance lends a certain weight of presumption in favor of the right to life as an ethical principle to take seriously. It does not mean that the right to life cannot be questioned or criticized. It only means that the right to life should be taken seriously in a discussion on ethical principles, because people have put some thought into such matters in the past, and their unanimity on accepting this principle indicates a presumption in its favor.

to sum up, in the direct approach the arousal of a mob mentality produces an immediate feeling of belonging for each person in the crowd. Each person feels united with the crowd, which evokes a sense of strength and security. When the crowd roars its approval of the conclusions that are then offered, anyone who does not accept them automatically cuts himself or herself off from the crowd and risks the loss of his or her security, strength, and acceptance. The same thing happens in the indirect approach, but the context and technique are somewhat subtler.

4) Argument against the Person (Argumentum ad Hominem)

Activity # 5: *Dear learners, what do you think is the fallacy of argument against the person?*

Argument against the person is another type of relevance fallacy. This fallacy always involves two arguers. One of them advances (either directly or implicitly) a certain argument and the other then responds by directing his or her attention not to the first person's argument but to the first person himself. When this occurs, the second person is said to commit an argument against the person. In any of the kinds of conversational frameworks in which people reason with each other, despite the opposition and partisanship characteristic of many kinds of dialogue, there must also be a

presumption that in order to achieve collaborative goals, participants must observe rules of polite conversation.

Arguers must be able to trust each other, to some extent at least, to be informative and relevant, to take turns politely, and to express their commitments clearly and honestly. Without this kind of collaboration in contributing to a dialogue, argument of a kind that uses reasoning to fulfill its goals of dialogue interaction would not be possible.

Attacking the other party's honesty or sincerity in argument is a powerful move. Such an argument leads one to the conclusion that such a person lacks credibility as an arguer who can be trusted to play by the rules. This argument is so powerful because it suggests that such a person cannot ever be trusted and that therefore whichever argument they use, it may simply be discounted as worthless. Thus, the person attacked cannot meaningfully take part in the dialogue any longer, no matter how many good arguments they seem to have. Because they are so powerful and dangerous, ad hominem arguments have often been treated in the past as fallacious.

The argument against the person occurs in three forms: the *ad hominem abusive*, the *ad hominem circumstantial*, and the *tu quoque*.

I. Ad Hominem Abusive Fallacy

In the ad hominem abusive, the second person responds to the first person's argument by verbally abusing the first person. The following is the form of ad hominem argument:

Premise: A is a person of bad character.
Conclusion: A's argument should not be accepted.

In this type of argument, A is the proponent of an argument that has been put forward. The premise that is alleged is that A is a person of bad character. What is normally cited is some aspect of A's character as a person, and often, character for veracity is the focus of the attack. The attack is directed to destroying the person's credibility, so that his argument is discounted or reduced in plausibility because of the reduction in credibility of the arguer. Thus, this type of attack is

particularly effective where a person's argument depends on his presumed honesty or good character for its plausibility. Consider the following example.

In defending animal rights, Mr. Abebe argues that the government should legislate a minimum legal requirement to any individuals or groups who want to farm animals. He argues that this is the first step in avoiding unnecessary pain on animals and protecting them from abuse. But we should not accept his argument because he is a divorced drunk person who is unable to protect even his own family.

The conclusion of the argument says that we should reject the idea of legislating a minimum legal requirement to protect animals. But what reason is offered to support the conclusion? That Abebe is a drunk and divorced person is the only reason given. But it is impossible to conclude that we should reject legislation a minimum legal requirement to protect animals from the idea that Abebe is a drunk and divorced person. This is just an explicit and direct personal attack.

II. Ad Hominem Circumstantial Fallacy

The second type of against the person fallacy is ad hominem circumstantial. The ad hominem circumstantial begins the same way as the ad hominem abusive, but instead of heaping verbal abuse on his or her opponent, the respondent attempts to discredit the opponent's argument by alluding to certain circumstances that affect the opponent. By doing so the respondent hopes to show that the opponent is predisposed to argue the way he or she does and should therefore not be taken seriously. Consider the following example:

Haileselassie I of Ethiopia argued in the League of Nations that member states should give hand to Ethiopia to expel the fascist Italy from the country. But the member states should not listen to the king. Haileselassie I argue in this way because he wants to resume his power once the Italian are expelled from Ethiopia.

This argument is fallacious because the arguer does not pay serious attention to the substance of the argument of the king. He just tried to discredit the idea of the king by association it with the circumstance with the Italian evacuation. He did not attack directly why member states should not help the country. The ad hominem circumstantial is easy to recognize because it always takes this form: *''Of course, Mr. X argues this way; just look at the circumstances that affect him.''*

III. Tu Quoque (You too) Fallacy

The tu quoque ("you too") fallacy begins the same way as the other two varieties of the ad hominem argument, except that the second arguer attempts to make the first appear to be hypocritical or arguing in bad faith. The second arguer usually accomplishes this by citing features in the life or behavior of the first arguer that conflict with the latter's conclusion. This fallacy has the following form: *''How dare you argue that I should stop doing X; why, you do (or have done) X yourself.''*

See the following example:

Patient to a Doctor: *Look Doctor, you cannot advise me to quit smoking cigarette because you yourself is a smoker. How do you advise me to quit smoking while you yourself is smoking?*

The argument is fallacious because whether the doctor smokes is irrelevant to whether the his premises support the conclusion that the patient should quit smoking cigarette; and the fact tha the doctor himself smokes does not make smoking right. Smoking is wrong whether the advisor himself did the action or not.

Dear learners, what relationships do you observe between tu quoque fallacy and the standard of consistency?

Are all arguments against the person fallacious? They are not. There are reasonable arguments against the person. Let us consider the first two types of against the person fallacy: abusive and circumstantial. In many textbooks, the direct ad hominem argument is called 'abusive', suggesting that it is a fallacious argument and is always wrong. But it can sometimes be reasonable argument. For example, in legal argumentation in a trial, it can be legitimate for a cross examining attorney to question the ethical character of a witness. The lawyer may even argue that the witness has lied in the past and use this argument to raise questions about his character for honesty. In such kind of argument, what is normally cited is some aspect of the person character, and often, character for veracity is the focus of the attack. For example, the allegation may be, "He is a liar!" The attack is directed to destroying the person's credibility, so that his argument is discounted or reduced in

plausibility because of the reduction in credibility of the arguer. Thus, this type of attack is particularly effective where a person's argument depends on his presumed honesty or good character for its plausibility.

The same is true in the case of circumstantial fallacy. It involves the attempt to discredit an opponent by suggesting that the opponent's judgment is distorted by some factor in his or her background condition. In some circumstances and conditions, the kind of belief people entertain or the kind of argument they advance could be purely the function of their circumstances. It is mere sociological facts that societies are segmented into many groups depend on their economic, social, religious, political and other factors. It is also true that the kind of political, economic and religious system one belongs to determine to a certain extent of what kind of ideas and beliefs people advocate. In general, what people accept as true to a greater or lesser degree determine by the particular position they assume in the society. In other word, most often people judgment blinded by their circumstances.

Thus, it is not always false that ad hominem fallacies are inherently unacceptable. Sometimes it could be reasonable and plausible to consider some judgment of individuals as blinded and limited by their circumstance. Capitalists and rich people want a free market economy where they can easily produce as much fortune as possible. They do not see the consequence of their action on the environment or on other people. Workers also want increase of salary without regard to its effects on the economy of the country or to the company. This shows that the circumstance of people affects their idea. Consider the following argument, which is advanced by director of medical association.

Mr. Abdella argued that medical doctors in the country burden many responsibilities. They are working day and night to satisfy the demand for good health. Thus, the government should increase the salary, housing and other necessary facilities for doctors

This argument seems that it is unreasonable and thus it is a fallacy of circumstance. But close inspection may reveals that it may not be a fallacy. This argument argues for increment of salary. Before judging whether it is a fallacy or not, we need to consider the economic conditions of the country and the relative income of medical doctor. If, in fact the country cannot afford salary

increment and medical doctors a as profession receives reasonably adequate income, it would be promoting self- interest to claim for additional salary.

5) Accident

Activity # 6: *Dear learners, what do you think is the fallacy of accident?*

The fallacy of accident is committed when a general rule is applied to a specific case it was not intended to cover. Typically, the general rule is cited (either directly or implicitly) in the premises and then wrongly applied to the specific case mentioned in the conclusion. Consider the following example:

Freedom of speech is a constitutionally guaranteed right. Therefore, John Q. Radical should not be arrested for his speech that incited the riot last week.

In this example, the general rule is that freedom of speech is normally guaranteed, and the specific case is the speech made by John Q. Radical. Because the speech incited a riot, the rule does not apply.

The fallacy of accident gets its name from the fact that one or more accidental features of the specific case make it an exception to the rule. In the example, the accidental feature is that the movement transgress the right to private property.

6) Straw Man

Activity # 7: *Dear learners, what do you think is the fallacy of straw man?*

The straw man fallacy is committed when an arguer distorts an opponent's argument for the purpose of more easily attacking it, demolishes the distorted argument, and then concludes that the opponent's real argument has been demolished. By so doing, the arguer is said to have set up a straw man and knocked it down, only to conclude that the real man (opposing argument) has been knocked down as well.

The following are the main features of straw man fallacy. First there are two individuals or groups discussing about some controversial issues; the two has opposite views. One of the arguers presents

his views about the issues and the other is a critic. Second the critic however does not rationally criticize the main or the substantive argument of the opponent. Rather he criticizes ideas which are the misrepresentation of the main content of the argument. He does so for easy attacking the argument. Third the critic concludes, by criticizing the misrepresented ideas that he knock down the main ideas. Since the critic does not attack the main ideas, rather he criticized the misrepresented argument, one can argues he did not criticize the argument at all. Consider the following argument.

Mr. Belay believes that ethnic federalism has just destroyed the country and thus it should be replaced by geographical federalism. But we should not accept his proposal. He just wants to take the country back to the previous regime. Geographical federalism was the kind of state structure during Derg and monarchical regime. We do not want to go back to the past. Thus, we should reject Mr. Belay's proposal.

This argument involves two persons: Mr. Belay and his critic. Mr. Belay argues for geographical federalism and his critic opposing the view. This critics show that the critic do not refute or oppose the idea of geographical federalism. Rather he first misrepresented geographical federalism as going back to the past and then he criticizes the past regime and by doing so he believed the real argument knocked down. But he did not criticize the substance of the argument; he criticizes distorted idea which do not represent his opponent. This is an example of how straw man fallacy is committed.

When the fallacy of straw man occurs readers should keep in mind two things. First, they have to try to identify the original argument, which is misrepresented by the critic. Second, they should look for what gone wrong in the misrepresentation of the argument. Is the critic exaggerated the original argument or is he introduced a new assumption which is not presumed by the original argument.

Dear learners, do you see any relationship between straw man fallacy and the principle of charity?

7) Missing the Point (Ignoratio Elenchi)

Activity # 8: *Dear learners, what do you think is the fallacy of missing the point?*

All the fallacies we have discussed thus far have been instances of cases where the premises of an argument are irrelevant to the conclusion. Missing the point, however, illustrates a special form of irrelevance. It occurs when the premises of an argument support one particular conclusion, but then a different conclusion, often vaguely related to the correct conclusion, is drawn. Whenever one suspects that such a fallacy is being committed, he or she should be able to identify the correct conclusion, the conclusion that the premises logically imply. Ignoratio elenchi means "ignorance of the proof." The arguer is ignorant of the logical implications of his or her own premises and, as a result, draws a conclusion that misses the point entirely. Consider the following argument.

The world is in the process of globalizing more than ever. The world economy is becoming more and more interconnected. Multinational companies and supra national institutions are taking power from local companies and national governments. The livelihood of people is randomly affected by action and decision made on the other side of the planet and this process benefits only the rich nations at the expense of the poor. What should be done? The answer is obvious: poor nations should detach themselves from the process.

Are the premises and the conclusion in this argument related? It is unrelated. The correct conclusion would be to redirect globalization in a way that is beneficial for both the poor and the rich, not to detach countries from the process. The above conclusion however is logically not related with the premises. After all, detachment from globalization process is more costly for poor countries. It is better to regulate the process of globalization than to detach altogether from the system if that is possible.

8) Red Herring

Activity # 9: *Dear learners, what do you think is the fallacy of missing the point?*

This fallacy is closely associated with missing the point. It is committed when the arguer diverts the attention of the reader or listener by changing the subject to a different but sometimes subtly related one. He or she then finishes by either drawing a conclusion about this different issue or by merely presuming that some conclusion has been established. By so doing, the arguer purports to have won the argument.

The fallacy gets its name from a procedure used to train hunting dogs to follow a scent. A red herring (smoked and dried fish species) is dragged across the trail with the aim of leading the dogs astray. Since red herrings have an especially potent scent (caused in part by the smoking process used to preserve them), only the best dogs will follow the original scent.

To use the red herring fallacy effectively, the arguer must change the original subject of the argument without the reader or listener noticing it. One way of doing this is to change the subject to one that is subtly related to the original subject**.** Consider the following argument to understand the point clearly.

The editors of Addis Flower newspaper have accused our company of being one of the city's worst water polluters. But Addis flower newspaper is responsible for much more pollution than we are. After all, they own a Paper Company, and that company discharges tons of chemical residues into the city's river every day.

Dear learners, do you think this is a good argument. Let us analyze this argument. There are two individuals here: a certain editor accusing a certain company about its impact on water quality and the response of representative of the company. The editor accused the company as a worst water polluter. But the response from the representative is not about why it is not a worst polluter; rather it changes the topic into the activity of the paper company in which the editor is working and accused the company as a worst water polluter. In other words, attention is diverted from the original topic into a new topic.

Now the question is: is it a right response? The answer is no; because even if the paper company is the worst water polluters that does not mean that the editor accusation is wrong. The editor's accusation is wrong only if evidence is given which proof to the contrary. But no evidence is given to proof it; rather the activity of another company is discussed which is logically irrelevant with the original topic. So it is called red herring fallacy because the topic is slightly changed into another but closely related topic. But if the readers do not have experience in following ideas, they will not notice that there is change of the topic.

A second way of using the red herring effectively is to change the subject to some flashy, eye-

catching topic that is virtually guaranteed to distract the listener's attention. Topics of this sort include sex, crime, scandal, immorality, death, and any other topic that might serve as the subject of gossip. Here is an example of this technique:

Professor Conway complains of inadequate parking on our campus. But did you know that last year Conway carried on a torrid love affair with a member of the English Department? The two used to meet every day for clandestine sex in the copier room. Apparently they didn't realize how much you can see through that fogged glass window. Even the students got an eyeful. Enough said about Conway.

The red herring fallacy can be confused with the straw man fallacy because both have the effect of drawing the reader/listener off the track. This confusion can usually be avoided by remembering the unique ways in which they accomplish this purpose. In the straw man, the arguer begins by distorting an opponent's argument and concludes by knocking down the distorted argument. In the red herring, on the other hand, the arguer ignores the opponent's argument (if there is one) and subtly changes the subject. Thus, to distinguish the two fallacies, one should attempt to determine whether the arguer has knocked down a distorted argument or simply changed the subject. Also keep in mind that straw man always involves two arguers, at least implicitly, whereas a red herring often does not.

Both the red herring and straw man fallacies are susceptible of being confused with missing the point, because all three involve a similar kind of irrelevancy. To avoid this confusion, one should note that both red herring and straw man proceed by generating a new set of premises, whereas missing the point does not. Straw man draws a conclusion from new premises that are obtained by distorting an earlier argument, and red herring, if it draws any conclusion at all, draws one from new premises obtained by changing the subject. Missing the point, however, draws a conclusion from the original premises. Also, in the red herring and straw man, the conclusion, if there is one, is relevant to the premises from which it is drawn; but in missing the point, the conclusion is irrelevant to the premises from which it is drawn. Finally, remember that missing the point serves in part as a kind of catchall fallacy, and a fallacious argument should not be identified as a case of missing the point if one of the other fallacies clearly fits.

Lesson 3: Fallacies of Weak Induction

Activity # 1: *Dear learners, do you remember the principle of sufficiency we have discussed in the previous chapter? Do you relate the principle of sufficient with the fallacy of weak induction?*

Lesson overview

The main function of premises in an argument is to provide reasons so that a reasonable person would accept the truth of the conclusion. It is a rule of a good argument to contain premises that together constitute sufficient grounds for the truth of the conclusion. They must provide sufficient reasons for a rational person to accept the conclusion as true. In some arguments, premises provide strong reason for the conclusion to be acceptable. Sometimes, however, premises may not successfully support the conclusion. If premises do not support the conclusion strongly then the resulting argument will be labeled as *Weak Induction*.

The fallacy of weak induction violates the principles of sufficiency, which states that whenever a person presents an argument for or against a position, he/she should attempt to provide relevant and acceptable reasons of the right kind, that together are sufficient in number and weight to justify the acceptance of the conclusion. Therefore, the fallacies of weak induction occur not because the premises are logically irrelevant to the conclusion, as is the case with the eight fallacies of relevance, but because the connection between premises and conclusion is not strong enough to support the conclusion.

There are different kinds of fallacies of weak induction and the following are the most important ones: *Appeal to Unqualified Authority, Hasty Generalization, False Cause, Weak Analogy, Slippery Slope,* and *Appeal to Ignorance*. In each of these fallacies, the premises provide at least a shred of evidence in support of the conclusion, but the evidence is not nearly good enough to cause a reasonable person to believe the conclusion. Like the fallacies of relevance, however, the fallacies of weak induction often involve emotional grounds for believing the conclusion. In this lesson, we will discuss the above six fallacies of weak induction.

Lesson objectives:

At the end of this lesson, you will be able to:

- Recognize the varieties of fallacies of weak induction.
- To identify the particular fallacy of weak induction committed in a certain argument.

9) Appeal to Unqualified Authority (Argumentum ad Verecundiam)

Activity # 2: *Dear learners, what do you think is the fallacy of appeal to unqualified authority?*

We saw in the second chapter that argument from authority is inductive argument. It is discussed that appeal to authority or otherwise called appeal to expert opinion is an argument in which the conclusion depends on a testimony of expert or knowledgeable people.

It is frequently the case in personal, social, and political deliberations that one does not know all the relevant facts. One may get information from another person who has the facts. For example if you want to know whether the sun is the centre of the universe or not, or if you want to know whether all matters are made of subatomic particle, you can ask people who are knowledgeable in the area. One can improve chances of getting correct information by choosing a source that has reason to think is reliable. But to some extent, you will have to rely on presumption or trust that your source is knowledgeable and honest and is not misinforming you.

However, the cited authority or witness could lacks credibility for different reasons. The person might lack the requisite expertise, might be biased or prejudiced, might have a motive to lie or disseminate "misinformation," or might lack the requisite ability to perceive or recall.

The appeal to unreliable authority (or ad verecundiam fallacy) is an appeal to an authority when the reliability of the authority may be reasonably doubtable. When an appeal to unreliable authority is made, the arguer assumes, without sufficient warrant, that the authority in question is reliable. When there is legitimate doubt about whether an authority is reliable, then the appeal to authority

is fallacious. Ad verecundiam fallacies are common in advertising when celebrities who lack the relevant expertise endorse products. Consider the following example.

The famous artists, artist Woriku said that Vera Pasta is the most nutritious food. So Vera pasta must be the most nutritious food.

Artist Worku could be good artists but we want to know whether he is an expert on nutrition and the argument leave us in doubt about that.

A more subtle appeal to unreliable authority occurs when a well-known expert in one field is cited as an expert in another field even though he or she lacks expertise in it. This form of fallacy is especially subtle if the two fields are related. Consider the following example.

Prof. Kebede, who is an expert in animal science, argued that, in more complex societies, there is higher level of division of labor and in less complex societies, there is less division of labor.

This argument as you can see is flawed. This is because the expert's field of specialization and the conclusion he made are unrelated. He is an expert in biology but he gives us a witness on society.

This argument also reminds us of another point to keep in mind when evaluating an appeal to authority, namely, that the appeal to authorities in matters of controversy is often problematic. After all, in such matters, the authorities themselves often disagree. And when this occurs, if we have no good reason to suppose that one authority is more likely to be correct than another, then the appeal to authority should be unconvincing. For instance, in matters involving religious and moral issues it is difficult to find an ultimate authority to give final decision. Whatever the expertise of the authority, it is safe not to depend on this authority for knowledge.

10) Appeal to Ignorance (Argumentum ad Ignorantiam)

Activity # 3: *Dear learners, what do you think is the fallacy of appeal to ignorance?*

When the premises of an argument state that nothing has been proved one way or the other about something, and the conclusion then makes a definite assertion about that thing, the argument commits an *appeal to ignorance***.** The issue usually involves something that is incapable of being proved or something that has not yet been proved. Observe the following example:

People have been trying for centuries to provide conclusive evidence for the claims that Haileselassie I of Ethiopia is the descendant of King David of Israel and no one has ever succeeded. Therefore, we must conclude that Haileselassie I of Ethiopia is not the descendant of King David of Israel.

Conversely, the following argument commits the same fallacy:

People have been trying for centuries to prove the claims that Haileselassie I of Ethiopia is not the descendant of King David of Israel, and no one has ever succeeded. Therefore, we must conclude that Haileselassie I of Ethiopia is in fact the descendant of King David of Israel. .

The premises of an argument are supposed to provide positive evidence for the conclusion. The premises of these arguments, however, tell us nothing about the alleged relationship between Haileselassie I of Ethiopia and Kind David of Israel; rather, they tell us about what certain unnamed and unidentified people have tried unsuccessfully to do. This evidence may provide some slight reason for believing the conclusion, but certainly not sufficient reason.

However, these examples do lead us to the first of two important exceptions to the appeal to ignorance. The first stems from the fact that if qualified researchers investigate a certain phenomenon within their range of expertise and fail to turn up any evidence that the phenomenon exists, this fruitless search by itself constitutes positive evidence about the question. Consider, for example, the following argument:

Teams of historian have tried for long time to verify the proposition that King Tewodros II of Ethiopia did not commit suicide during the British attack of Maqdella but they failed to do so. Therefore, we must conclude that King Tewodros actually committed suicide at Maqdella.

The premises of this argument are true. Given the circumstances, it is likely that the historian in question would have proved if King Tewodros II did not commit suicide. Since they did not proof

it, it likely that he did commit suicide. Thus, we can say that the above argument is inductively strong.

As for the two arguments about the alleged relationship between Haileselassie I of Ethiopia and Kind David of Israel, if the attempts to prove or disprove the historical claims had been done in a systematic way by qualified experts, it is more likely that the arguments would be good. But as these arguments stand, the premises state nothing about the qualifications of the investigators, and so the arguments remain fallacious.

The second exception to the appeal to ignorance relates to courtroom procedure. In Ethiopia, a person is presumed innocent until proven guilty. If the prosecutor in a criminal trial fails to prove the guilt of the defendant beyond reasonable doubt, counsel for the defence may justifiably argue that his or her client is not guilty. Example:

Members of the jury, you have heard the prosecution present its case against the defendant. Nothing, however, has been proved beyond a reasonable doubt. Therefore, under the law, the defendant is not guilty.

This argument commits no fallacy because "not guilty" means, in the legal sense, that guilt beyond a reasonable doubt has not been proved. The defendant may indeed have committed the crime of which he or she is accused, but if the prosecutor fails to prove guilt beyond a reasonable doubt, the defendant is considered "not guilty."

11) Hasty Generalization (Converse Accident)

Activity # 4: *Dear learners, what do you think is the fallacy of hasty generalization?*

Hasty generalization is a defective form of argument from inductive generalization. A generalization is an argument that proceeds from the knowledge of a selected sample to some claim about the whole group. Because the members of the sample have a certain characteristic, it is argued that all the members of the group have that same characteristic. For example, if we wanted to know the opinion of the student body at a certain university about whether to adopt a law

prohibiting the use of face book in campuses, we could take a poll of 10 per cent of the students. If the results of the poll showed that 80 percent of those sampled favored the law, we might draw the conclusion that 80 percent of the entire student body favored it. These illustrate the use of statistics in inductive argumentation.

The problem that arises with the use of samples has to do with whether the sample is representative of the population. Samples that are not representative are said to be biased. Depending on what the population consists of, whether machine parts or human beings, different considerations enter into determining whether a sample is biased. These considerations include (1) whether the sample is randomly selected, (2) the size of the sample, and (3) psychological factors.

A sample is random if and only if every member of the population has an equal chance of being selected. The requirement that a sample be randomly selected applies to practically all samples, but sometimes it can be taken for granted. The randomness requirement must be given more attention when the population consists of discrete units. The randomness requirement presents even greater problems when the population consists of human beings.

Suppose, for example, that a public opinion poll is to be conducted on the question of environmental protection. It would hardly do to ask such a question randomly capitalists and owner of multinational companies. Such a sample would almost certainly be biased in favor of the corporations. A less biased sample could be obtained by randomly selecting phone numbers from the telephone directory, but even this procedure would not yield a completely random sample. Among other things, the time of day in which a call is placed influences the kind of responses obtained. Most people who are employed full time are not available during the day, and even if calls are made at night, a large percentage of the population have unlisted numbers.

A poll conducted by mail based on the addresses listed in the city directory would also yield a fairly random sample, but this method, too, has shortcomings. Many dwellers may not be listed, and others move before the directory is printed. Furthermore, none of those who live in rural areas are listed. In short, it is both difficult and expensive to conduct a large-scale public opinion poll that succeeds in obtaining responses from anything approximating a random sample of individuals.

Size is also an important factor in determining whether a sample is representative. Given that a sample is randomly selected, the larger the sample, the more closely it replicates the population. In statistics, this degree of closeness is expressed in terms of sampling error. The sampling error is the difference between the relative frequency with which some characteristic occurs in the sample and the relative frequency with which the same characteristic occurs in the population. If, for example, a poll were taken of workers and 60 percent of the members sampled expressed their intention to vote for Gudeta but in fact only 55 percent of the whole union intended to vote for Gudeta, the sampling error would be 5 percent. If a larger sample were taken, the error would be less.

Now we can discuss about hasty generalization. It is a fallacy that affects inductive generalizations. The fallacy occurs when there is a reasonable likelihood that the sample is not representative of the group. Such likelihood may arise if the sample is either too small or not randomly selected. Consider the following examples.

Addis Zemen Gazeta carried an interview to know the reading skill among young people. It has found out that, among ten young people it interviewed, none of them read a book for the last two years. The conclusion is obvious: all young people in the country do not have the culture of reading books.

In these arguments, a conclusion about a whole group is drawn from premises that mention only a few instances. Because such small, atypical samples are not sufficient to support a general conclusion, the argument commits a hasty generalization.

The mere fact that a sample may be small, however, does not necessarily mean that it is atypical. On the other hand, the mere fact that a sample may be large does not guarantee that it is typical. In the case of small samples, various factors may intervene that render such a sample typical of the larger group.

12) False Cause Fallacy

Activity # 5: *Dear learners, what do you think is the fallacy of false cause?*

False cause fallacy is a defective and flawed form of argument from causality. Before discussing about false cause, we need to discuss about causal inference first. Argument from causality is a kind of argument which argues either from the knowledge of causes to the knowledge of effects or from the knowledge of the effect to the knowledge of causes. In such argument two things are presented as having causal connection.

However, it seems that there is no settled scientific theory of causality. It seems that the causal relationship is practical and contextual in nature. What it means to say that, one state of affairs A causes another state of affairs B, is that A is something that can be brought about and when it is brought about (or stopped), then B is also brought about (or stopped).

Whatever causality means, the most important kind of evidence that event A causes event B in any particular case, is that there is a statistical correlation between A and B: event A and event B are correlated. For example, if a significant statistical correlation is found between reduced incidence of heart attacks and drinking of red wine, the tentative conclusion may be drawn as a hypothesis is that drinking red wine is the cause of the reduction in heart attacks.

A correlation is a purely statistical relationship, determined by counting up numbers where one event occurs in a case where another event also occurs. One problem with arguments from correlation to cause is that there may not be a real correlation between two events, but people might believe that relation exists. Another problem is that a statistical correlation between two events can simply be a coincidence. Consider the following example.

A sophisticated statistical study by Dr. Zemenu Ahmed and Pro. Wakjira Negera citing studies from 141 countries found that the larger the per cent of its gross national product a country spends on weapons, the higher is its infant death rate. Dr. Zemenu Ahmed and Pro. Wakjira concluded that there is a plausible link between military spending and the infant death rate.

However, critics questioned whether their finding represents anything more than a coincidence. Dr. Bilal Ahmed a statistician at the Ethiopian statistics authority said that the same statistical approach could be used to show a causal link between infant mortality and the consumption of

bananas. He questioned whether statistical correlation between two things, in cases like these, is a reason to conclude that one thing causes the other.

Another critical question is whether both things correlated with each other are really caused by some common factor that is causing both of them. The following case is a classic example.

At a conference on the bond between humans and pets in Boston in 1986, researchers reported that pets can lower blood pressure in humans, improve the survival odds of heart patients, and even penetrate the isolation of autistic children. According to a report in Newsweek researchers at the conference reported on the beneficial effects of pet companionship. Studies showed that women who had owned dogs as children scored higher on self-reliance, sociability, and tolerance tests than petless women. Men who had owned a dog "felt a greater sense of personal worth and of belonging and had better social skills." Children with pets also showed greater empathy.

In this case, there was a genuine correlation between pet ownership and health improvement, but both factors could well be the result of the better than average social qualities of the people who acquire pets. In a case like this, there may be a genuine correlation between two factors A and B, but the reason for the correlation is that some third factor C, is causing both A and B. In such a case, it is not correct to draw the conclusion that A causes B.

Argument from correlation to cause is extremely useful for practical purposes in guiding action in practical matters. But in many cases, there is a natural human tendency to leap too quickly to a causal conclusion once a correlation has apparently been observed. In such cases, it is better to ask appropriate critical questions before placing too much weight on an argument from correlation to cause.

The fallacy of false cause occurs whenever the link between premises and conclusion depends on some imagined causal connection that probably does not exist. Whenever an argument is suspected of committing the false cause fallacy, the reader or listener should be able to say that the conclusion depends on the supposition that X causes Y, whereas X probably does not cause Y at all. There are many varieties of false cause fallacy. Perhaps the most common form is post hoc, ergo propter hoc, which means in Latin "after this, therefore because of this." This form of the false cause

fallacy occurs whenever an arguer illegitimately assumes that because event X preceded event Y, X caused Y. Here is an example:

Since I came into office two years ago, the rate of violent crime has decreased significantly. So, it is clear that the longer prison sentences we recommended are working.

The longer prison sentences may be a causal factor, of course, but the mere fact that the longer sentences preceded the decrease in violent crime does not prove this. Many other possible causal factors need to be considered. For example, have economic conditions improved? Are more jobs available? Have the demographics of the area changed so that the population of young men is smaller relative to the population as a whole? Has there been an increase in the number of police officers on patrol? Obviously, mere temporal succession is not sufficient to establish a causal connection. Nevertheless, this kind of reasoning is quite common and lies behind most forms of superstition.

The second type of fallacy are called non causa pro causa ("not the cause for the cause"). This variety is committed when what is taken to be the cause of something is not really the cause at all and the mistake is based on something other than mere temporal succession.

Successful business executives are paid salaries in excess of $100,000. Therefore, the best way to ensure that Ferguson will become a successful executive is to raise his salary to at least $100,000.

In this argument success as an executive cause increases in salary—not the other way around—so the argument mistakes the cause for the effect.

A third variety of the false cause fallacy, and one that is probably committed more often than either of the others in their pure form, is oversimplified cause. This variety occurs when a multitude of causes is responsible for a certain effect but the arguer selects just one of these causes and represents it as if it were the sole cause. Consider the following example.

In Ethiopia, the grades of fresh students in universities have been dropping for several years. What accounts for this? Well, during these same years, the average time students spend on facebook

(per day) has increased. So, the cause is obvious: students are spending much of their time surfing on facebook when they need to be reading instead.

The increase in time spent surfing on face book is a likely contributor to a drop in scores of fresh students. But insufficient evidence is provided for the conclusion that the time spent surfing on face book is the sole cause. Other factors may be at work, such as a decrease in parental involvement or deficiencies in the university system.

The oversimplified cause fallacy is usually motivated by self-serving interests. Sometimes the arguer wants to take undeserved credit for himself or give undeserved credit to some movement with which he or she is affiliated. At other times, the arguer wants to heap blame on an opponent or shift blame from himself or herself onto some convenient occurrence.

Instances of the fallacy can resemble either the post hoc or the non-causa pro causa varieties in that the alleged cause can occurs either prior to or concurrently with the effect. It differs from the other varieties of false cause fallacy in that the single factor selected for credit or blame is often partly responsible for the effect, but responsible to only a minor degree.

13) Slippery Slope Fallacy

Activity # 6: *Dear learners, what do you think is the fallacy of slippery slope?*

Slippery slope fallacy is a defective form of argument from slippery slope. Before discussing about slippery slope fallacy, some points should be raised about slippery slope argument. One very common form of argumentation is used when one party in a dialogue says to the other, “This action would not be good, because it could have bad consequences.” For example, suppose you are thinking of taking a certain medication and your doctor says, “You have high blood pressure, and taking this medication raises blood pressure, so in your case there would be a bad side effect of taking it.” This form of argumentation is called argument from consequences.

It cites allegedly foreseeable consequences of a proposed action as the premise, and the conclusion is then inferred that this course of action is or is not recommended. This form of reasoning can be

used in a positive or negative way, as an argument to respond to a proposal that has been put forward when two parties are having a dialogue on what to do. In argument from positive consequences, a policy or course of action is supported by citing positive consequences of carrying out this policy or course of action. In argument from negative consequences, a policy or course of action is argued against by citing negative consequences of carrying it out.

A slippery slope argument is a species of negative reasoning from consequences, used where two parties are deliberating together and one warns the other not to take a contemplated action, because it is a first step in a sequence of events that will lead to some horrible outcome. What is distinctive about the slippery slope argument as a special subtype of argument from consequences is that there is said to be a connected sequence of actions, such that once the first action in the series is carried out, a sequence of other actions will follow, so that once the sequence starts there is no stopping it, until (eventually) the horrible outcome comes about. This particularly horrible outcome is the final event in the sequence and represents something that would very definitely go against goals that are important for the participant in the deliberation who is being warned, for example, it might be his personal safety or security.

The characteristic idea of the slippery slope argument is that once you take that first action in the sequence, it is like pushing off from the top of an Olympic ski-jump run. Once you have kicked off, turning back becomes harder and harder. At some ill-defined point or grey area, there is no turning back. Once you are into this area, there is only one way to go: faster and faster down the slope until you hit the bottom. So if you don't want to go careening down the slope out of control and hit the bottom (with disastrous consequences of personal injury), the message is that you had better not take that first step at all.

Slippery slope fallacy occurs when the arguer assumes that a chain reaction will occur but there is insufficient evidence that one (or more) events in the chain will cause the others; when there is no actual or real connection among the chain of events. The chains of causes are supposedly like a steep slope - if you take one step on the slope; you'll slide all the way down. And since you don't want to slide all the way down, don't take the first step. Consider the following example.

Against cultural, social and religious norms of Ethiopia, a Chinese firm was authorized to run donkey slaughter house in Bishoftu. But this company should be closed. If donkeys are continuously slaughtered and exported, then Ethiopian who works in the abattoir will start to eat donkey meat. Then members of the family of these workers will be the next to eat donkey meat. This gradually leads their neighbors and the village to accept the same practice. Finally, the whole country will follow which in turn leads to the total collapse of Ethiopian food culture.

The links in this alleged chain are weak. This is not to say that donkey slaughter house is risk free practice. It is only to say that, logically speaking, when causal connections are claimed, there needs to be sufficient evidence that the connections are genuine. And to claim that opening donkey slaughter house in the country necessary leads to adopting donkey meat as a culture is plainly to make a claim that is insufficiently supported by the evidence.

The fallacy of slippery slope is a variety of the false cause fallacy. Deciding whether a slippery slope fallacy has been committed can be difficult when there is uncertainty whether the alleged chain reaction will or will not occur. But many slippery slopes rest on a mere emotional conviction on the part of the arguer that a certain action or policy is bad, and the arguer attempts to trump up support for his or her position by citing all sorts of dire consequences that will result if the action is taken or the policy followed. In such cases there is usually little problem in identifying the argument as a slippery slope.

14) Weak Analogy

Activity # 7: *Dear learners, what do you think is the fallacy of weak analogy?*

Weak analogy is a defective or flawed argument from analogy. Argument from analogy is a very commonly used kind of case-based reasoning, where one case is held to be similar to another case in a particular respect. Since the one case is held to have a certain property, then the other case, it is concluded, also has the same property (because the one case is similar to the other).

Two things, situations or cases could be similar to each other in certain respects, but dissimilar in other respects. While one case may be generally similar to another, it does not mean that the two cases will be similar in every respect. If they were similar in every respect, they would be identical case. However, two cases can be generally similar, even though there are quite important differences between them. Consider the following example.

After ingesting one milligram of substance alpha per day for ninety days, white mice developed genetic abnormalities. Since white mice are similar in many ways to humans, it follows that substance alpha probably produces genetic abnormalities in humans.

This argument compares two cases, the effects of some substances on human and mice. It argues that this substance produces genetic abnormalities on mice, then postulates comparable consequences on humans. It is built onto an argument from analogy; based on a comparison between the two cases. Of course, the two cases are different in certain respects, but by comparing them, it puts forward a plausible argument.

The fallacy of weak analogy is committed when the analogy between things, situations and circumstance is not strong enough to support the conclusion that is drawn. Evaluating an argument having this form requires a two-step procedure: (1) Identify the attributes a, b, c,. . that the two entities A and B share in common, and (2) determine how the attribute z, mentioned in the conclusion, relates to the attributes a, b, c, . . . If some causal or systematic relation exists between z and a, b, or c, the argument is strong; otherwise it is weak.

In the example above about the similarity between mice and human being, it was evaluated as strong argument because there is systematic relation between the two. For example, both are mammals and as such they share common similarities that belong to all mammals. In addition to this, being animals is the bases for further similarities. Since they share similarity in terms of biological metabolism, this tendency will provide a strong reason for the conclusion to be true. Most probably both will respond in similar way for the substance alpha. Consider the following weak analogy argument.

When an individual is diagnosed as having cancer, every effort is made to kill the cancerous growth, whether by surgery, radiation treatment, or chemotherapy. But murderers and kidnappers are cancerous growths on society. Therefore, when these criminals are apprehended and convicted, they should be treated like any other cancer and eliminated by capital punishment.

This argument is based on a similarity between the growth of cancer in human body and the existence of criminals in society. It is true that when a certain cell is identified as cancer every effort would be made to kill it because it is impossible to rehabilitate the cell and the only safe measure is to kill the cell. But this is not true in human being. Even if a criminal is bad for society, society avoids crime not by killing criminals but by educating and rehabilitating individual criminals. Thus, this analogy is fallacy because the conclusion is based on weak or inadequate analogy between a human being and a cell.

Lesson 4: Fallacies of Presumption

Lesson overview

The fallacies of presumption include *begging the question, complex question, false dichotomy,* and *suppressed evidence.* These fallacies arise not because the premises are irrelevant to the conclusion or provide insufficient reason for believing the conclusion but because the premises presume what they purport to prove. Begging the question presumes that the premises provide adequate support for the conclusion when in fact they do not, and complex question presumes that a question can be answered by a simple "yes,""no," or other brief answer when a more sophisticated answer is needed. False dichotomy presumes that an "either . . . or . . ." statement presents jointly exhaustive alternatives when in fact it does not, and suppressed evidence presumes that no important evidence has been overlooked by the premises when in fact it has. In this lesson, we will discuss the fallacies of presumption.

Lesson objectives:

At the end of this lesson, you are expected to:

- Recognize the varieties of fallacies of presumption.
- Identify the particular fallacy of presumption committed in a certain argument.

15) Begging the Question (Petitio Principii)

Activity # 1: *Dear learners, what do you think is the fallacy of begging the question?*

The fallacy of begging the question is committed whenever the arguer creates the illusion that inadequate premises provide adequate support for the conclusion by leaving out a possibly false (shaky) key premise, by restating a possibly false premise as the conclusion, or by reasoning in a circle. The Latin name for this fallacy, petition principii, means "request for the source." The actual source of support for the conclusion is not apparent, and so the argument is said to beg the question. After reading or hearing the argument, the observer is inclined to ask, "But how do you know X?" where X is the needed support.

The first, and most common, way of committing this fallacy is by leaving a possibly false key premise out of the argument while creating the illusion that nothing more is needed to establish the conclusion. Examples:

Murder is morally wrong. This being the case, it follows that abortion is morally wrong.

Of course, humans and apes evolved from common ancestors. Just look how similar they are.

It's obvious that the poor in this country should be given handouts from the government. After all, these people earn less than the average citizen.

Clearly, terminally ill patients have a right to doctor-assisted suicide. After all, many of these people are unable to commit suicide by themselves.

The first of these arguments begs the question "How do you know that abortion is a form of murder?" The second begs the question "Does the mere fact that humans and apes look similar imply that they evolved from common ancestors?" The third and fourth beg the questions "Just because the poor earn less than the average citizen, does this imply that the government should give them handouts?" and "Just because terminally ill patients cannot commit suicide by themselves, does it follow that they have a right to a doctor's assistance?"

These questions indicate that something has been left out of the original arguments. Thus, the first argument is missing the premise, "Abortion is a form of murder"; the second is missing the premise, "If humans and apes look similar, then they have common ancestors;" and so on. These premises are crucial for the soundness of the arguments. If the arguer is unable to establish the truth of these premises, then the arguments prove nothing. However, in most cases of begging the question, this is precisely the reason why such premises are left unstated. The arguer is not able to establish their truth, and by employing rhetorical phraseology such as "of course," "clearly," "this being the case," and "after all," the arguer hopes to create the illusion that the stated premise, by itself, provides adequate support for the conclusion when in fact it does not.

The same form of begging the question often appears in arguments concerning religious topics to justify conclusions about the existence of God, the immortality of the soul, and so on. Example:

The world in which we live displays an amazing degree of organization. Obviously, this world was created by an intelligent God.

This argument begs the question, "How do you know that the organization in the world could only have come from an intelligent creator?" Of course, the claim that it did come from an intelligent creator may well be true, but the burden is on the arguer to prove it. Without supporting reasons or evidence, the argument proves nothing. Yet most people who are predisposed to believe the conclusion are likely to accept the argument as a good one. The same can be said of most arguments that beg the question, and this fact suggests another reason why arguers resort to this fallacy: Such arguments tend to reinforce pre-existing inclinations and beliefs.

The second form of petito principii occurs when the conclusion of an argument merely restates a possibly false premise in slightly different language. In such an argument, the premise supports the conclusion, and the conclusion tends to reinforce the premise. Examples:

Capital punishment is justified for the crimes of murder and kidnapping because it is quite legitimate and appropriate that someone be put to death for having committed such hateful and inhuman acts.

Anyone who preaches revolution has a vision of the future for the simple reason that if a person has no vision of the future, he could not possibly preach revolution.

In the first argument, saying that capital punishment is "justified" means the same thing as saying that it is "legitimate and appropriate," and in the second argument, the premise and the conclusion say exactly the same thing. However, by repeating the same thing in slightly different language, the arguer creates the illusion that independent evidence is being presented in support of the conclusion, when in fact it is not. Both arguments contain rhetorical phraseology ("hateful and inhuman," "simple reason," and "could not possibly") that help effect the illusion. The first argument begs the question, "How do you know that capital punishment really is legitimate and appropriate?" and the second beg the question, "How do you know that people who preach revolution really do have a vision of the future?"

The third form of petito principii involves circular reasoning in a chain of inferences having a first premise that is possibly false. Here is an example:

Harar brewery clearly produces the finest beer in Ethiopia. We know they produce the finest beer because they have the best chemist. This is because they can afford to pay them more than other brewery. Obviously, they can afford to pay them more because they produce the finest beer in the country.

Upon encountering this argument, the attentive reader is inclined to ask, "Where does this reasoning begin? What is its source?" Since the argument goes in a circle, it has no beginning or source, and as a result it proves nothing. Of course, in this example the circularity is rather apparent, so the argument is not likely to convince anyone. Cases in which circular reasoning may convince involve long and complex arguments having premises that depend on one another in subtle ways and a possibly false key premise that depends on the conclusion.

16) Complex Question

Activity # 2: *Dear learners, what do you think is the fallacy of complex question?*

The fallacy of complex question is committed when two (or more) questions are asked in the guise of a single question and a single answer is then given to both of them. Every complex question presumes the existence of a certain condition. When the respondent's answer is added to the complex question, an argument emerges that establishes the presumed condition. Thus, although not an argument as such, a complex question involves an implicit argument. This argument is usually intended to trap the respondent into acknowledging something that he or she might otherwise not want to acknowledge.

Examples:

Have you stopped cheating on exams?
Where did you hide the corpse of the person you killed?

Let us suppose the respondent answers "yes" to the first question and "under the bed" to the second. The following arguments emerge:

You were asked whether you have stopped cheating on exams. You answered "yes."Therefore, it follows that you have cheated in the past.

You were asked where you hide the body of the person you killed. You replied "under the bed." It follows that you were in fact killed the person.

On the other hand, let us suppose that the respondent answers "no" to the first question and "nowhere" to the second. We then have the following arguments:

You were asked whether you have stopped cheating on exams. You answered "no." Therefore, you continue to cheat.

You were asked where you hide the body of the person you killed. You answered "nowhere."It follows that you have destroyed the corpse.

Obviously, each of the questions is really two questions:

Did you cheat on exams in the past? If you did cheat in the past, have you stopped now?

Where did you hide the corpse of the person you killed? If you were killed it, where did you hide it?

If respondents are not sophisticated enough to identify a complex question when one is put to them, they may answer quite innocently and be trapped by a conclusion that is supported by no evidence at all; or, they may be tricked into providing the evidence themselves. The correct response lies in resolving the complex question into its component questions and answering each separately.

The fallacy of complex question should be distinguished from another kind of question known in law as a leading question. A leading question is one in which the answer is in some way suggested in the question. Whether or not a question is a leading one is important in the direct examination of a witness by counsel. Example:

Tell us, on April 9, did you see the defendant shoot the deceased?

Leading questions differ from complex questions in that they involve no logical fallacies—that is, they do not attempt to trick the respondent into admitting something he or she does not want to admit. To distinguish the two, however, it is sometimes necessary to know whether prior questions have been asked.

17) False Dichotomy

Activity # 3: *Dear learners, what do you think is the fallacy of false dichotomy?*

The fallacy of false dichotomy is committed when a disjunctive ("either . . . or . . .") premise presents two unlikely alternatives as if they were the only ones available, and the arguer then eliminates the undesirable alternative, leaving the desirable one as the conclusion. Such an argument is clearly valid, but since the disjunctive premise is false, or at least probably false, the argument is typically unsound. The fallacy is often committed by children when arguing with their parents, by advertisers, and by adults generally. Here are three examples:

Classical democracy is originated either from the Gada System or from Athens.
Classical democracy did not originate from ancient Athens
Thus, it must originate from the Gada System.

Either you are going to buy me a new car or I will divorce you.
You do not want me divorce you.
Thus, you have to buy me a new car.

In none of these arguments does the disjunctive premise present the only alternatives available, but in each case, the arguer tries to convey that impression. For example, in the first argument, the arguer tries to convey the impression that democracy cannot originates in other places than Athens or the Gada System and that no other alternatives are possible. Clearly, however, this is not the case.

The fallacious nature of false dichotomy lies in the illusion created by the arguer that the disjunctive premise presents jointly exhaustive alternatives. If it did, the premise would be true of necessity. For example, the statement "Either Awash River is in Afar, or it is not in Afar" presents jointly exhaustive alternatives and is true of necessity. But in the fallacy of false dichotomy, the two alternatives not only fail to be jointly exhaustive, but they are not even likely. As a result, the disjunctive premise is false, or at least probably false. Thus, the fallacy amounts to making a false or probably false premise appear true. If one of the alternatives in the disjunctive premise is true, then fallacy is not committed. For example, the following argument is valid and sound:

Either Abay River is in Ethiopia or it is in South Africa.
River Abay is not in South Africa.
Therefore, River Abay is in Ethiopia.

False dichotomy is otherwise called "false bifurcation" and the "either-or fallacy."Also, in most cases the arguer expresses only the disjunctive premise and leaves it to the reader or listener to supply the missing statements.

18) Suppressed Evidence

Activity # 4: *Dear learners, what do you think is the fallacy of suppressed evidence?*

Chapter 2 explained that a cogent argument is an inductive argument with good reasoning and true premises. The requirement of true premises includes the proviso that the premises not ignore some

important piece of evidence that outweighs the presented evidence and entails a very different conclusion. If an inductive argument does indeed ignore such evidence, then the argument commits the fallacy of suppressed evidence. Consider the following argument:

Somalia is a good place for investment for the following reasons. First there are cheap raw materials. Second there is cheap labor. Third there is good market for our product. Forth there is a port that helps us to export our product. Thus, we have to consider investing in Somalia.

If the arguer ignores the fact that there is no peace and stability in Somalia then the argument commits a suppressed evidence fallacy. This fallacy is classified as a fallacy of presumption because it works by creating the presumption that the premises are both true and complete when in fact they are not.

Perhaps the most common occurrence of the suppressed evidence fallacy appears in inferences based on advertisements. Nearly every advertising neglect to mention certain negative features of the product advertised. As a result, an observer who sees or hears an advertisement and then draws a conclusion from it may commit the fallacy of suppressed evidence. Example:

The advertise for Kentucky Fried Chicken says, "Buy a bucket of chicken and have a barrel of fun!" *Therefore, if we buy a bucket of that chicken, we will be guaranteed to have lots of fun.*

The advertise fails to state that the fun does not come packaged with the chicken but must be supplied by the buyer. Also, of course, the advertise fails to state that the chicken is loaded with fat and that the buyer's resultant weight gain may not amount to a barrel of fun. By ignoring these facts, the argument based on the advertising is fallacious.

Another way that an arguer can commit the suppressed evidence fallacy is by ignoring important events that have occurred with the passage of time that render an inductive conclusion improbable. Here is an example:

During the past fifty years, Poland has enjoyed a rather low standard of living. Therefore, Poland will probably have a low standard of living for the next fifty years.

This argument ignores the fact that Poland was part of the Soviet bloc during most of the past fifty years, and this fact accounts for its rather low standard of living. However, following the collapse

of the Soviet Union, Poland became an independent nation, and its economy is expected to improve steadily during the next fifty years.

Yet another form of suppressed evidence is committed by arguers who quote passages out of context from sources such as the Bible, the Constitution, and the Bill of Rights to support a conclusion that the passage was not intended to support. Consider, for example, the following argument against gun control:

The Second Amendment of the American Constitution states that the right of the people to keep and bear arms shall not be infringed. But a law controlling handguns would infringe the right to keep and bear arms. Therefore, a law controlling handguns would be unconstitutional.

In fact, the Second Amendment reads, "A well- regulated militia being necessary to the security of a free state, the right of the people to keep and bear arms shall not be infringed."In other words, the amendment states that the right to bear arms shall not be infringed when the arms are necessary for the preservation of a well-regulated militia. Because a law controlling handguns (pistols) would have little effect on the preservation of a well-regulated militia, it is unlikely that such a law would be unconstitutional.

The suppressed evidence fallacy is similar to the form of begging the question in which the arguer leaves a key premise out of the argument. The difference is that suppressed evidence leaves out a premise that requires a different conclusion, while that form of begging the question leaves out a premise that is needed to support the stated conclusion. However, because both fallacies proceed by leaving a premise out of the argument, there are cases where the two fallacies overlap.

Lesson 5: Fallacies of Ambiguity and Grammatical Analogy

Lesson overview

The fallacies of ambiguity include *equivocation and amphiboly.* These fallacies arise from the occurrence of some form of ambiguity in either the premises or the conclusion (or both). An expression is ambiguous if it is susceptible to different interpretations in a given context. When the conclusion of an argument depends on a shift in meaning of an ambiguous word or phrase or

on the wrong interpretation of an ambiguous statement, the argument commits a fallacy of ambiguity.

The fallacies of grammatical analogy include *composition* and *division.* Arguments that commit these fallacies are grammatically analogous to other arguments that are good in every respect. Because of this similarity in linguistic structure, such fallacious arguments may appear good yet be bad. In this lesson, we will discuss the four fallacies.

Lesson objectives:

At the end of this lesson, you are expected to:

- Recognize the varieties of fallacies of ambiguity.
- Recognize the varieties of fallacies grammatical analogy.
- Identify the fallacy of ambiguity committed in a certain argument.
- Identify the fallacy of grammatical analogy committed in a certain argument.

5.1 Fallacies of Ambiguity

These fallacies arise from the occurrence of some form of ambiguity in either the premises or the conclusion (or both). An expression is ambiguous if it is susceptible to different interpretations in a given context. When the conclusion of an argument depends on a shift in meaning of an ambiguous word or phrase or on the wrong interpretation of an ambiguous statement, the argument commits a fallacy of ambiguity.

Activity # 1: *Dear learners, do you remember the principle of clarity we have discussed in the previous chapter? Do you relate the principle of clarity with the fallacy of ambiguity?*

19) Equivocation

Activity # 2: *Dear learners, what do you think is the fallacy of equivocation?*

The fallacy of equivocation occurs when the conclusion of an argument depends on the fact that a word or phrase is used, either explicitly or implicitly, in two different senses in the argument. Such arguments are either invalid or have a false premise, and in either case they are unsound.

Examples:

Some triangles are obtuse. Whatever is obtuse is ignorant. Therefore, some triangles are ignorant.

Any law can be repealed by the legislative authority. But the law of gravity is a law. Therefore, the law of gravity can be repealed by the legislative authority.

We have a duty to do what is right. We have a right to speak out in defence of the innocent.

Therefore, we have a duty to speak out in defence of the innocent.

In the first argument, "obtuse" is used in two different senses. In the first premise it describes a certain kind of angle, while in the second it means dull or stupid. The second argument equivocates on the word "law." In the first premise it means statutory law, and in the second it means law of nature. The third argument uses "right" in two senses. In the first premise "right" means morally correct, but in the second it means a just claim or power.

To be convincing, an argument that commits an equivocation must use the equivocal word in ways that are subtly related. Of the three examples given above, only the third might fulfill this requirement. Since both uses of the word "right" are related to ethics, the unalert observer may not notice the shift in meaning. Another technique is to spread the shift in meaning out over the course of a lengthy argument. Political speechmakers often use phrases such as "equal opportunity," "gun control," "national security," and "environmental protection" in one way at the beginning of a speech and in quite another way at the end.

20) Amphiboly

Activity # 3: *Dear learners, what do you think is the fallacy of amphiboly?*

The fallacy of amphiboly occurs when the arguer misinterprets an ambiguous statement and then draws a conclusion based on this faulty interpretation. The original statement is usually asserted by someone other than the arguer, and the ambiguity usually arises from a mistake in grammar or punctuation - a missing comma, a dangling modifier, an ambiguous antecedent of a pronoun, or some other careless arrangement of words. Because of this ambiguity, the statement may be understood in two clearly distinguishable ways. The arguer typically selects the unintended interpretation and proceeds to draw a conclusion based upon it. Here are some examples:

The tour guide said that standing in Mesqel Square, the new federal police building could easily be seen. It follows that the Empire State Building is in Greenwich Village.

Habtom told Megeressa that he had made a mistake. It follows that Habtom has at least the courage to admit his own mistakes.

The premise of the first argument contains a dangling modifier. Is it the observer or the building that is supposed to be standing in Greenwich Village? The factually correct interpretation is the former. In the second argument the pronoun "he" has an ambiguous antecedent; it can refer either to Habtom or Megressa. Perhaps Habtom told Megressa that *Megreesa had* made a mistake. Ambiguities of this sort are called *syntactical ambiguities.*

Two areas where cases of amphiboly cause serious problems involve contracts and wills. The drafters of these documents often express their intentions in terms of ambiguous statements, and alternate interpretations of these statements then lead to different conclusions.

Examples:

Mrs. Zenebu stated that in her will that "I leave my house and my clothes to Lemma and Mengistu." Therefore, we conclude that Lemma gets the house and Mengistu gets the car.

In the first example, the conclusion obviously favors Lemma. Mengistu is almost certain to argue that the gift of the clothes and the house should be shared equally by her and Lemma. Mrs. Zenebu could have avoided the dispute by adding either "respectively" or "collectively" to the end of the sentence.

Amphiboly differs from equivocation in two important ways. First, equivocation is always traced to an ambiguity in the meaning of a word or phrase, whereas amphiboly involves a syntactical ambiguity in a statement. The second difference is that amphiboly usually involves a mistake made by the arguer in interpreting an ambiguous statement made by someone else, whereas the ambiguity in equivocation is typically the arguer's own creation. If these distinctions are kept in mind, it is usually easy to distinguish amphiboly from equivocation. Occasionally, however, the two fallacies occur together, as the following example illustrates:

> *The Great Western Cookbook recommends that we serve the oysters when thoroughly stewed. Apparently the delicate flavor is enhanced by the intoxicated condition of the diners.*

First, it is unclear whether ''stewed'' refers to the oysters or to the diners, and so the argument commits an amphiboly. But if ''stewed'' refers to the oysters it means ''cooked,'' and if it refers to the diners it means ''intoxicated.'' Thus, the argument also involves an equivocation.

5.2 Fallacies of Grammatical Analogy

The fallacies of grammatical analogy are grammatically analogous to other arguments that are good in every respect. Because of this similarity in linguistic structure, such fallacious arguments may appear good yet be bad.

21) Composition

Activity # 4: *Dear learners, what do you think is the fallacy of composition?*

The fallacy of composition is committed when the conclusion of an argument depends on the erroneous transference of an attribute from the parts of something onto the whole. In other words, the fallacy occurs when it is argued that because the parts have a certain attribute, it follows that the whole has that attribute too and the situation is such that the attribute in question cannot be legitimately transferred from parts to whole.

Examples:

Each player on this basketball team is an excellent athlete. Therefore, the team as a whole is excellent.
Each atom in this piece of chalk is invisible. Therefore, the chalk is invisible.

Sodium and chlorine, the atomic components of salt, are both deadly poisons. Therefore, salt is a deadly poison.

In these arguments, the attributes that are transferred from the parts onto the whole are designated by the words "excellent," "invisible" and "deadly poison," respectively. In each case the transference is illegitimate, and so the argument is fallacious. Not every such transference is illegitimate, however. Consider the following arguments:

Every atom in this piece of chalk has mass. Therefore, the piece of chalk has mass.
Every component in this picket fence is white. Therefore, the whole fence is white..

In each case, an attribute (having mass, being white) is transferred from the parts onto the whole, but these transferences are quite legitimate. Indeed, the fact that the atoms have mass is the very reason *why* the chalk has mass. The same reasoning extends to the fence. Thus, the acceptability of these arguments is attributable, at least in part, to the *legitimate* transference of an attribute from parts onto the whole.

Further caution is required by the fact that composition is sometimes confused with hasty generalization. The only time this confusion is possible is when the "whole" is a class (such as the class of people in a city or the class of trees in a forest), and the "parts" are the members of the class. In such a case, composition proceeds from the members of the class to the class itself. Hasty generalization, on the other hand, proceeds from the specific to the general. Because it is sometimes easy to mistake a statement about a class for a general statement, composition can be mistaken for hasty generalization. Such a mistake can be avoided if one is careful to keep in mind the distinction between these two kinds of statements. This distinction falls back on the difference between the ***collective*** and the ***distributive*** predication of an attribute. Consider the following statements:

Statement One: *Fleas are small.*

Statement Two: *Fleas are numerous.*

The first statement is a general statement. The attribute of being small is predicated distributively; that is, it is assigned (or distributed) to each and every flea in the class. Each and every flea in the class is said to be small. The second statement, on the other hand, is a statement about a class as a whole, or what we will call a ‘‘class statement.’’ The attribute of being numerous is predicated collectively; in other words, it is assigned not to the individual fleas but to the class of fleas. The meaning of the statement is not that each and every flea is numerous but that the class of fleas is large.

To distinguish composition from hasty generalization, therefore, the following procedure should be followed. Examine the conclusion of the argument. If the conclusion is a general statement- that is, a statement in which an attribute is predicated distributively to each and every member of a class- the fallacy committed is hasty generalization. But if the conclusion is a class statement- that is, a statement in which an attribute is predicated collectively to a class as a whole- the fallacy is composition.

Example:

Less gasoline is consumed by a car than by a truck. Therefore, less gasoline is consumed in the United States by cars than by trucks.

At first sight this argument might appear to proceed from the specific to the general and, consequently, to commit a hasty generalization. But in fact the conclusion is not a general statement at all but a class statement. The conclusion states that the whole class of cars uses less gas than does the whole class of trucks (which is false, because there are many more cars than trucks). Since the attribute of using less gasoline is predicated collectively, the fallacy committed is composition.

22) Division

Activity # 5: *Dear learners, what do you think is the fallacy of composition?*

The fallacy of division is the exact reverse of composition. As composition goes from parts to whole, division goes from whole to parts. The fallacy is committed when the conclusion of an argument depends on the erroneous transference of an attribute from a whole (or a class) onto its parts (or members).

Examples:

Salt is a non-poisonous compound. Therefore, its component elements, sodium and chlorine, are non-poisonous.

The Royal Society is over 300 years old. General Merid Hussein is a member of the Royal Society. Therefore, General Merid Hussein is over 300 years old.

In each case the attribute, designated respectively by the terms "non-poisonous," and "over 300 years old," is illegitimately transferred from the whole or class onto the parts or members. As with the fallacy of composition, however, this kind of transference is not always illegitimate. The following argument contains no fallacy:

This piece of chalk has mass. Therefore, the atoms that compose this piece of chalk have mass.

Just as composition can sometimes be confused with hasty generalization (converse accident), division can sometimes be confused with accident. As with composition, this confusion can occur only when the "whole" is a class. In such a case, division proceeds from the class to the members, while accident proceeds from the general to the specific. Thus, if a class statement is mistaken for a general statement, division may be mistaken for accident. To avoid such a mistake, one should analyze the premises of the argument. If the premises contain a general statement, the fallacy committed is accident; but if they contain a class statement, the fallacy is division.

Chapter Summary

A fallacy is a mistake in an argument that arises from something other than merely false premises. Usually fallacies involve defects in reasoning or the creation of an illusion that makes a bad argument appear good. Fallacies can be either formal or informal. A formal fallacy is one that can be detected by analyzing the form of an argument; such fallacies affect only deductive arguments. An informal fallacy is one that can be identified only by analyzing the content of an argument; such fallacies can affect both deductive and inductive arguments.

The fallacies of relevance occur when the premises of an argument are not relevant to the conclusion. Cases of such irrelevance occur in premises that threaten the observer, elicit pity from the observer, create a mob mentality in a group of observers, appeal to the observer's desire for security, verbally abuse an opposing arguer, present an opposing arguer as predisposed to argue as he does, present an opposing arguer as a hypocrite, misapply a general rule, distort an opponent's argument, or lead the observer off the track. A kind of catch-all fallacy, missing the point, occurs when an arguer draws a conclusion different from the one implied by the premises.
The fallacies of weak induction occur when the premises, although possibly relevant to the conclusion, provide insufficient support for the conclusion. Cases of such inadequate support occur when the arguer cites an authority who is not qualified, draws a conclusion from premises that give no positive evidence, draws a conclusion from an atypical sample, depends on a non - existent or minor causal connection, depends on a chain reaction that is unlikely to occur, or draws a conclusion from an analogy that is not close enough to support it.

The fallacies of presumption occur when the premises presume what they purport to prove. Such presumptions occur when the arguer creates the illusion that inadequate premises are adequate, asks a question that comprises two or more questions, uses a disjunctive statement that falsely claims to exhaust the available alternatives, or ignores important evidence that requires a different conclusion.

The fallacies of ambiguity occur when the conclusion depends on some form of linguistic ambiguity. Either a word or phrase is used in more than one sense or the wrong interpretation is given to an ambiguous statement.

The fallacies of grammatical analogy occur when a defective argument appears good owing to a grammatical similarity to some argument that is not fallacious. Such grammatical similarities occur in arguments that wrongly transfer an attribute from parts to a whole or from a whole to its parts.

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CHAPTER SIX

CATEGORICAL PROPOSITIONS

Chapter Overview:

Dear students, in the fifth chapter of this course, we have seen Logical Reasoning and Fallacies. However, this chapter emphasizes the standard forms of categorical statements and their immediate inferences, difference between the modern and traditional squares of opposition what otherwise are called Boolean and Aristotelian Square of Oppositions, evaluating immediate inferences: Venn Diagrams and Square of Oppositions and Logical Operations: Conversion, Obversion, and Contraposition.

Chapter Objectives:

Having studied this lesson, you will be able to:

- Define what a categorical proposition is
- Explain the four standard categorical Propositions
- Explain the attributes of a categorical proposition in terms of quality and quantity
- Understand the immediate inferences based on the rules of conversion, obversion and contraposition
- Describe the logical oppositions between the four propositions based on their square of relations.

Lesson 1: General Introduction

Lesson overview:

Dear students, it is clear that the discussions so far, in the previous chapters, provide you clue insights to what it means, in logic, *categorical* and *proposition*. A proposition that relates two classes, or categories, is called a categorical proposition. The classes in question are denoted respectively by the subject term and the predicate term, and the proposition asserts that either all or part of the class denoted by the subject term is included in or excluded from the class denoted by the predicate term. To put the same ideas in different words, a categorical proposition is a

statement that relates two sets, classes, groups or categories which are presented in their subject or predicate positions that could be connected based on inclusion (partial/whole) or exclusion (partial/whole) relations.

Lesson objectives:

At the end of this lesson, students will be able to:

- ✓ Understand what it is categorical proposition means.
- ✓ Recognize the various components of a standard forms of categorical proposition
- ✓ Distinguish the feasible difference between traditional and modern squares of opposition

What are Categorical Propositions?

Dear learners, , the term category or categorical, in this respect, refers to set of things, such as, human beings, animals, plants, workers, ladies, and so on. In a categorical proposition, these and other set of things appears in the subject and predicate part of a proposition. The term proposition refers to the information content or meaning of a statement. However, to avoid inconvenience, we can use the terms statement and proposition interchangeably for this purpose. Categorical propositions are in general simple, easy or plain statements that relate two classes of things based on the rule of exclusion or inclusion principles.

Here are some examples of categorical propositions:

- ➢ *Every human being is mortal*
- ➢ *Nothing that is a human which is eternal*
- ➢ *There exists a fish that is a shark.*
- ➢ *There are plants which are not edible.*

All the above statements are categorical propositions. This is due to the fact that in each statement two sets of things are related either in the form of inclusion or exclusion. In the first example, two set of things are given: human being (which is the subject of the statement) and mortal (the predicate of the statement). And we see that these two classes (human beings and mortal beings) are related based on inclusion relation, that is, without exception all human beings are included

part of in the class of mortal beings. This proposition is contrary to the third proposition, because it says that human beings are not belonged (not included) in to the class of eternal beings. This is to say that human beings are entirely excluded from the class of eternal beings. In all the above cases, there are certain difficulties. The amount of the set of things is not clearly stated based on fixed quantifiers. It is very difficult to determine the type of relation of the two classes in the form of inclusion or exclusion. It is ambiguous to decide the attribute (nature) of statements either negatively or positively and to determine their logical relation with other statements. These and other related problems urge us to study categorical propositions based on fixed logical standard-forms. Since any categorical proposition asserts that either all or part of the class denoted by the subject term is included in or excluded from the class denoted by the predicate term, it follows that there are exactly four types of categorical propositions:

- *Those that assert that the whole subject class is included in the predicate class*
- *Those that assert that part of the subject class is included in the predicate class*
- *Those that assert that the whole subject class is excluded from the predicate class*
- *Those that assert that part of the subject class is excluded from the predicate class.*

1.1 Standard-Forms of Categorical Proposition

Dear learners, to determine the validity and invalidity of the immediate inferences of categorical statements and to identify the formal fallacies committed in invalid arguments based on the criteria of logical rules, categorical propositions should be stated in standard form. A categorical proposition that expresses these relations with complete clarity is called a *standard-form categorical proposition.*

Dear learners, before we start dealing with the standard forms of categorical statements, you need to recapitulate the main points of the previous discussions.

Activity # 1. *Attempt the following Questions.*

- ✓ *What is Category?*
- ✓ *What is Proposition?*
- ✓ *Identify role of inclusion and exclusion.*

The standard form of categorical propositions is designed in accordance with the rules of the partial or whole inclusion and exclusion of the two classes stated in the subject and predicate of the proposition. The whole subject class is included in the predicate class. (the principle of total inclusion).

Example:

All men are mortal.
All birds are feathery.
All mammals are animals.

The whole subject class is excluded from the predicate class. (the principle of total exclusion).

Example:

No men are eternal.
No Muslims are Christians.
No blacks are white.

Partially the subject class is included in the predicate class. (the principle of partial inclusion).

Example:
Some birds are mammals.
Some politicians are liars.
Some students are lazy.

Partially the subject class is excluded from the predicate class. (the principle of partial exclusion).

Example:
Some snakes are not poisonous.
Some plants are not edible.
Some Ethiopians are not friendly.

1.2 The Components of Categorical Propositions

🗣 ***Dear learners, we have defined Proposition in the technical sense, as the meaning or information content of a statement.***

🗣 ***Note that: For the purposes of this course, "proposition" and "statement" are used interchangeably." Thus, for the purpose of this course we will use "proposition" and "statement" interchangeably.***

A proposition or statement is a sentence that is either true or false. This being the case, categorical proposition is defined as a proposition that relates two classes, or categories. The classes in question are denoted respectively by the subject term and the predicate term. The proposition asserts that either all or part of the class denoted by the subject term is included in or excluded from the class denoted by the predicate term. Accordingly, we have four propositions and each of these propositions has quantifier, subject term, sentential connective and predicate term. These are, in general, known as the components of a categorical proposition. Study the following points.

- **Quantifier** = 'All', 'No' and 'Some' indicate the quantity or amount of the subject class.
- **Subject term** = any term (word) or phrase that consists of set of things.
- **Copula** = 'Are' and are 'not'. The Latin copula is a sentential connective that relates the subject and predicate terms.
- **Predicate term** – A term consisting set of things, which has some kind of relation with the subject term.

Dear students, please note that the four components of standard form can, otherwise, be summarized as follow:

(1) *Those that assert that the whole subject class is included in the predicate class*

(2) *Those that assert that part of the subject class is included in the predicate class,*

(3) *Those that assert that the whole subject class is excluded from the predicate class,*

(4) *Those that assert that part of the subject class is excluded from the predicate* class

The following is, therefore, the correct order of the standard form of a categorical proposition.

= Quantifier + subject term + copula + predicate term.

Consider the following example:

All members of the Ethiopian Medical Association are people holding degrees from recognized academic institutions. This standard-form categorical proposition is analyzed as follows:

Quantifier: *all*

Subject term: *members of the Ethiopian Medical Association*

Copula: *are*

Predicate term: *people holding degrees from recognized academic institutions*

A categorical proposition is in standard form if and only if it is a substitution instance of one of the following four forms:

- ✓ *All S are P.*
- ✓ *No S are P.*
- ✓ *Some S are P.*
- ✓ *Some S are not P.*

Given the subject an predicate terms and its four components, categorical propositions could be stated in standard form symbolically -as follows.

All S are P = All members of S is in P class.

No S are P = No members of S is in P class.

Some S are P = At least one member of S is in P class.

Some S are not P = At least one member of S is not in P class.

Note: In logic, the quantifier "some" always mean "at least one".

Example: *Some businesses are not profitable.*

Quantifier: *Some*

Subject term: *businesses*

Copula: *are not*

Predicate term: *Profitable*

Standard form: *Some S are not P*

Lesson 2: Attributes of Categorical Propositions: Quality, Quantity, and Distribution

Lesson overview:

Quality and quantity are attributes of categorical propositions. Here, it is useful to rephrase the meaning of categorical propositions in class terminology:

Proposition	**Meaning in class notation**
All *S* are *P*.	Every member of the *S* class is a member of the *P* class; that is, the *S* class is included in the *P* class.
No *S* are *P*.	No member of the *S* class is a member of the *P* class; that is, the *S* class is excluded from the *P* class.
Some *S* are *P*.	At least one member of the *S* class is a member of the *P* class.
Some *S* are not *P*.	At least one member of the *S* class is not a member of the *P* class.

These are the three fundamental concepts that would help us to deal with the properties of the four standard forms of categorical statement.

Lesson objectives:

At the end of this lesson, you will be able to:

- ✓ Know the four attributes of categorical proposition
- ✓ Understand how to represent different categorical propositions in 'Letter' 'Names'.

Activity # 1: *Dear students, please attempt the following questions:*

1. *What do you think of the need for representing categorical propositions by letter names?*
2. *Guess what are the four components of categorical proposition and their functions in logical arguments?*

A. Quality:

It refers to those set of things stated in the subject term that are included or excluded from those set of things stated in the predicate term. If the subject term refers to those classes of things, which are included (partially/entirely) in the predicate term, the proposition is said to be affirmative, while

if the subject term refers to those classes of things that are excluded (partially/entirely) the proposition is said to be negative. Study the following table.

Standard form	*Quality*
All S are P	*Affirmative*
No S are P	*Negative*
Some S are P	*Affirmative*
Some S are not P	*Negative*

B. Quantity: The quantity of a categorical proposition is determined by the amount or quantity of those set of things stated in the subject term. Accordingly, if the subject term refers entirely, the quantity of the proposition is said to be universal, whereas, if the amount of the subject class is stated partially, the quantity of the proposition is said to be particular. Study the following table.

Standard form	*Quantity*
All S are P	*Universal*
No S are P	*Universal*
Some S are P	*Particular*
Some S are not P	*Particular*

According to the quality and quantity of categorical propositions, logicians devised letter names of the four propositions. Letter names of the standard forms of categorical propositions, in this regard, would help us to:

- Save time and space
- Recapitulate the standard forms easily
- Apply various logical rules and study immediate inferences easily

Accordingly, the four-letter names: A, E, I and O are devised to represent the four standard forms of categorical propositions and it is summarized as follows.

Standard form	*Letter Name*
All S are P	*A*
No S are P	*E*
Some S are P	*I*
Some S are not P	*O*

Activity # 2

1. *Write a proposition in which its letter name is "O"*

   Example: Some students are not clever.

   _____

2. *Fill the blank space by writing "same" or "different"*

   A. *Proposition A and I are _____ in quality and _____ in quantity.*

   B. *Proposition E and O are _____ in quality and _____ in quantity.*

3. *Write the correct letter name and standard form on the given empty space.*

Some S are P	
	E
	All S are P
O	

C. **Distribution:** The concept of distribution emphasizes the terms (the subject & predicate terms) and not the proposition as such. If a term refers unambiguously the set of things stated in it entirely the term is said to be distributed. It implies that attribute of the class is distributed to each & every member of the class and we know clearly that the attribute is shared similarly by every member of the class. If a term does not state the class of things in this way, the term is said to be undistributed. Study the following table:

Standard form	*A term distributed*	*A term undistributed*
All S are P	*S*	*P*
No S are P	*S and P*	*None*
Some S are P	*None*	*S and P*
Some S are not P	*P*	*S*

Dear learners, please consider that all the above discussions are summarized as follows.

Letter Name	*Standard form*	*Quality*	*Quantity*	*Distribution*
A	*All S are P*	*Affirmative*	*Universal*	*S*
E	*No S are P*	*Negative*	*Universal*	*S & P*
I	*Some S are P*	*Affirmative*	*Particular*	*None*
O	*Some S are not P*	*Negative*	*Particular*	*P*

How to determine the quality, quantity & distribution? Study the following example.

In a proposition: Some birds are mammals: -

It's Letter name is *I*

Its Standard form is *Some S are P*

Its quality is *Affirmative*

Its quantity is *Particular*

A term, which is distributed, is none of the two terms.

A term, which is undistributed, is both terms (birds and mammals) are not distributed.

Lesson 3: Venn Diagrams and the Modern Square of Opposition

Lesson Overview:

The primary goal of our inquiry into categorical propositions is to disclose the role that such propositions play in the formation of arguments. Accordingly, in such interpretations, an argument might be valid or invalid. The standard forms of categorical statements can be represented in diagrams. The first known diagram of categorical propositions is called Euler diagram, after the 18th mathematician L. Euler. Later on, however, Euler diagram was found to be ineffective in identifying valid & invalid categorical syllogistic arguments and thereby new diagram for categorical propositions become indispensable.

Lesson Objectives:

At the end of this lesson, you will be able to:

- Understand what Venn diagram is in its broader sense, mean
- How to represent propositions/arguments in in diagram
- Distinguish the difference between modern and traditional square of opposition**.**

Activity #1: -

- ✓ *What do you think of to represent arguments/categorical propositions in a diagram?*
- ✓ *Make a group of five and discuss the feasible difference and similarities, if any, between modern and traditional squares of opposition.*

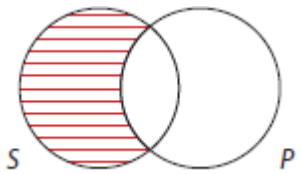
3.1 Representing Categorical Propositions in Diagrams

Adopting this interpretation of categorical propositions, the nineteenth-century logician John Venn developed a system of diagrams to represent the information they express. These diagrams have come to be known as **Venn diagrams.** Venn diagram is an arrangement of overlapping circles in which each circle represents the class denoted by a term in a categorical proposition. Because every categorical proposition has exactly two terms, the Venn diagram for a single categorical proposition consists of two overlapping circles. Each circle is labeled so that it represents one of the terms in the proposition. Unless otherwise required, we adopt the convention that the left-hand circle represents the subject term, and the right-hand circle of the predicate term. In such a diagram:

- The two categories (set of things) stated in the subject and predicate terms are represented by two overlapping circles.
- The shading part of the diagram depicts that there no member of the class exists; that is it is null or empty.
- The "*" or simply "X" shows that there is at least one member of the class exists.

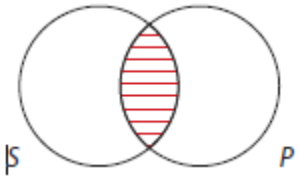
Study the following Venn diagrams.

1. Proposition A= All S are P



Ex. All Marists are revolutionary

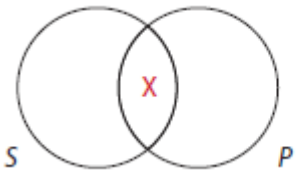
The shaded part does not represent the proposition All S are P, hence it is empty.



2. Proposition E = No S are P

Ex. No Marxists are revolutionary

The shaded part shows that the intersection area is empty. For the proposition "No S are P" no middle ground exists, hence the intersection area consists no member of S and P

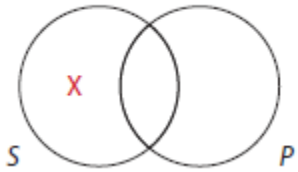


3. Proposition I = Some S are P

Ex. Some Marxists are revolutionary

The "X" sign depicts that there is at least one member of the class of S which exists in the class of P.

4. Proposition O = Some S are not P



5. Ex. Some Narcissists are not revolutionary.

The "X" sign is found outside the "P" circle, depicting that at least one member of S is not found in P class.

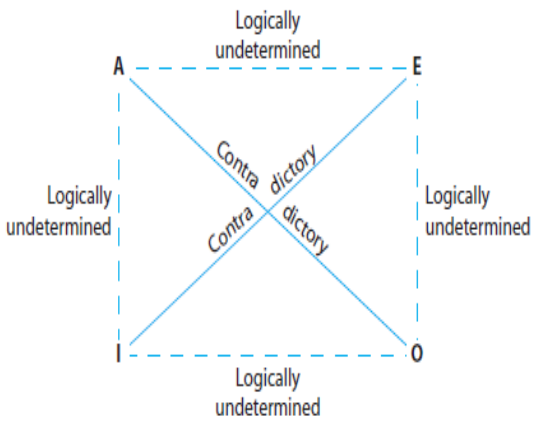
Recall that the **A** proposition asserts that no members of *S* are outside '*P'*. This is represented by shading the part of the '*S'* circle that lies outside the *P* circle. The **E** proposition asserts that no members of *S* are inside '*P'*. This is represented by shading the part of the *S* circle that lies inside the *P* circle. The 'I' proposition asserts that at least one *S* exists and that *S* is also a *P*. This is represented by placing an X in the area where the *S* and *P* circles overlap. This X represents an existing thing that is both an *S* and a *P*.

Finally, the **O** proposition asserts that at least one *S* exists, and that *S* is not a *P*. This is represented by placing an X in the part of the *S* circle that lies outside the *P* circle. Please note that 'X' represents an existing thing that is an *S* but not a *P*.

3.2 Squares of Opposition: Traditional and Modern Squares of Opposition

Dear students, to understand the modern and traditional square of opposition, let us compare the diagram for the **A** proposition with the diagram for the **O** proposition. The diagram for the **A** proposition asserts that the left -hand part of the *S* circle is empty, whereas the diagram for the **O** proposition asserts that this same area is not empty. These two diagrams make assertions that are the exact opposite of each other. As a result, their corresponding statements are said to contradict each other. Analogously, the diagram for the **E** proposition asserts that the area where the two circles overlap is empty, whereas the diagram for the **I** proposition asserts that the area where the two circles overlap is not empty. Accordingly, their corresponding propositions are also said to contradict each other. This relationship of mutually contradictory pairs of propositions is represented in a diagram called the **modern square of opposition.** This diagram arises from the modern (or **Boolean) interpretation of categorical propositions**.

It is represented as follows:



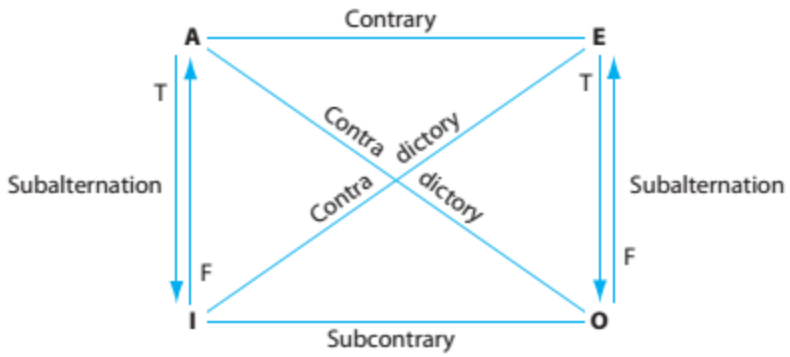
If two propositions are related by the **contradictory relation,** they necessarily have opposite truth value. Thus, if a certain '**A**' proposition is given as true, the corresponding '**O**' proposition must be false. Similarly, if certain '**I**' proposition is given as false, the corresponding '**E**' proposition must be true. But no other inferences are possible. In particular, given the truth value of an '**A** or **O**' proposition, nothing can be determined about the truth value of the corresponding **E** or **I** propositions. These propositions are said to have **logically undetermined truth value**. Like all propositions, they do have a truth value, but logic alone cannot determine what it is. Similarly, given the truth value of an **E** or **I** proposition, nothing can be determined about the truth value of the corresponding **A** or **O** propositions. They, too, are said to have logically undetermined truth value.

3.3 The Traditional Square of Opposition

In the previous lessons, we have adopted the Boolean standpoint, and we saw how the modern square of opposition applies regardless of whether the propositions refer to actually existing things. In this lesson, we adopt the Aristotelian standpoint, which recognizes that universal propositions about existing things have existential import. For such propositions, the traditional square of opposition becomes applicable. Like the modern square, the traditional square of opposition is an arrangement of lines that illustrates logically necessary relations among the four kinds of categorical propositions. However, because the Aristotelian standpoint recognizes the additional

factor of existential import, the traditional square supports more inferences than does the modern square.

It is represented as follows:



The four relations in the traditional square of opposition may be characterized as follows:

Contradictory = opposite truth value

Contrary = at least one is false (not both true)

Sub contrary = at least one is true (not both false)

Sub alternation = truth flows downward, falsity flows upward

The contradictory relation is the same as that found in the modern square. Thus, if a certain A proposition is given as true, the corresponding O proposition is false, and vice versa, and if a certain A proposition is given as false, the corresponding O proposition is true, and vice versa. The same relation holds between the E and I proposition. The contradictory relation thus expresses complete opposition between propositions. The contrary relation differs from the contradictory in that it expresses only partial opposition. Thus, if a certain A proposition is given as true, the corresponding E proposition is false (because at least one must be false), and if an E proposition is given as true, the corresponding A proposition is false. But if an A proposition is given as false, the corresponding E proposition could be either true or false without violating the "at least one is false" rule. In this case, the E proposition has logically undetermined truth value. Similarly, if an E proposition is given as false, the corresponding A proposition has logically undetermined truth value.

These results are borne out in ordinary language. Thus, if we are given the actually true A proposition “All cats are animals,” the corresponding E proposition “No cats are animals” is false, and if we are given the actually true E proposition “No cats are dogs, ”the corresponding A proposition “All cats are dogs” is false. Thus, the A and E propositions cannot both be true. However, they can both be false. “All animals are cats” and “No animals are cats” are both false. The sub contrary relation also expresses a kind of partial opposition. If a certain I proposition is given as false, the corresponding O proposition is true (because at least one must be true), and if an O proposition is given as false, the corresponding I proposition is true. But if either an I or an O proposition is given as true, then the corresponding proposition could be either true or false without violating the “at least one is true” rule. Thus, in this case the corresponding proposition would have logically undetermined truth value. If we are given the actually false I proposition “Some cats are dogs,” the corresponding O proposition “Some cats are not dogs” is true, and if we are given the actually false O proposition “Some cats are not animals,” the corresponding I proposition “Some cats are animals” is true. Thus, the I and O propositions cannot both be false, but they can both be true. “Some animals are cats” and “Some animals are not cats” are both true. The sub alternation relation is represented by two arrows: a downward arrow marked with the letter T (true), and an upward arrow marked with an F (false). These arrows can be thought of as pipelines through which truth values “flow.” The downward arrow “transmits” only truth, and the upward arrow only falsity. Thus, if an A proposition is given as true, the corresponding I proposition is true also, and if an I proposition is given as false, the corresponding A proposition is false. But if an A proposition is given as false, this truth value cannot be transmitted downward, so the corresponding I proposition will have logically undetermined truth value. Conversely, if an I proposition is given as true, this truth value cannot be transmitted upward, so the corresponding A proposition will have logically undetermined truth value. Analogous reasoning prevails for the sub alternation relation between the E and O propositions. To remember the direction of the arrows for sub alternation, imagine that truth “trickles down,” and falsity “floats” up.

Lesson 4: Evaluating Immediate Inferences: Using Venn Diagrams and Square of Oppositions

Lesson Overview:

Dear learners, Since the modern square of opposition provides logically necessary results, we can use it to test certain arguments for validity. We begin by assuming the premise is true, and we enter the pertinent truth value in the square. We then use the square to compute the truth value of the conclusion. If the square indicates that the conclusion is true, the argument is **valid**; if not, the argument is **invalid**.

Arguments of this sort are called **immediate inferences** because they have only one premise. Instead of reasoning from one premise to the next, and then to the conclusion, we proceed immediately to the conclusion.

Lesson objectives:

At the end of this lesson, student will be able to:

- ✓ Understand different logical inferences and represent them on appropriate diagram
- ✓ Test the validity and invalid of different arguments in different diagrams
- ✓ Perform the operations of conversion, obversion, and contraposition as indicated

Activities # 1 *please study following argument and attempt to evaluate it by using Venn Diagrams and Square of Oppositions:*

Some trade spies are not masters at bribery.

Therefore, it is false that all trade spies are masters at bribery.

Dear learners, in order to have better understanding on to evaluate inferences or to test argument for validity, let's reconsider, once again the above example that:

Some trade spies are not masters at bribery.

Therefore, it is false that all trade spies are masters at bribery.

To evaluate this argument, we begin by assuming that the premise, which is an **O** proposition, is true, and we enter this truth value in the square of opposition. We then use the square to compute

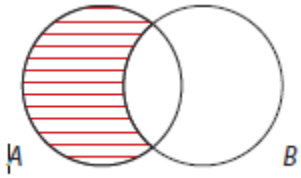
the truth value of the corresponding **A** proposition. By the contradictory relation, the **A** proposition is false. Since the conclusion claims that the **A** proposition is false, the conclusion is true, and therefore the argument is valid. Arguments that are valid from the Boolean standpoint are said to be **unconditionally valid** because they are valid regardless of whether their terms refer to existing things.

Note that the conclusion of this argument has the form "It is false that all *S* are *P*." Technically, statements of this type are not standard-form propositions because, among other things, they do not begin with a quantifier. To remedy this difficulty we adopt the convention that statements having this form are equivalent to "'All *S* are *P*' is false." Analogous remarks apply to the negations of the **E**, **I**, and **O** statements. We begin by assuming that the premise is true. Since the premise claims that an **A** proposition is false, we enter "false" into the square of opposition. We then use the square to compute the truth value of the corresponding **E** proposition. Since there is no relation that links the **A** and **E** propositions, the **E** proposition has undetermined truth value. Thus, the conclusion of the argument has undetermined truth value, and the argument is **invalid.**
We can also use Venn diagrams to test immediate inferences for validity. However, using this technique often requires that we diagram statements beginning with the phrase "It is false that." Let us begin by showing how to diagram such statements. Here are two examples:

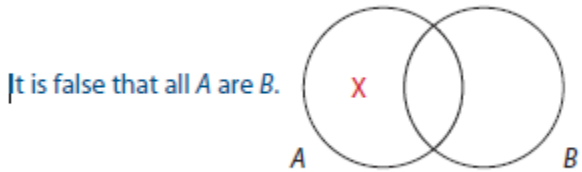
It is false that all A are B.
It is false that some A are B.

The first statement claims that "All *A* are *B*" is false. Thus, to diagram it, we do the exact opposite of what we would do to diagram "All *A* are *B*." To diagram "All *A* are *B*," we shade the left -hand part of the *A* circle:

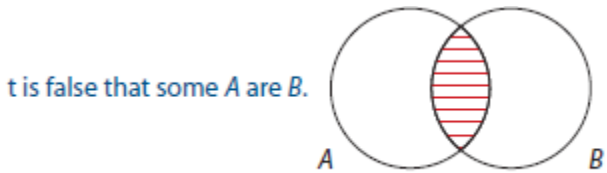
All *A* are *B*.



To diagram "It is false that all *A* are *B*," we enter an X in the left-hand part of the *A* circle. Entering an X in an area is the opposite of shading an area:



Any statement that is diagrammed by entering an X in an area is a particular proposition. Thus, as the diagram shows, "It is false that all *A* are *B*" is actually a particular proposition. By similar reasoning, "It is false that no *A* are *B*" is also a particular proposition. To diagram "It is false that some *A* are *B*," we do the exact opposite of what we would do to diagram "Some *A* are *B*." For "Some *A* are *B*," we would enter an X in the overlap area. Thus, to diagram "It is false that some *A* are *B*," we shade the overlap area:

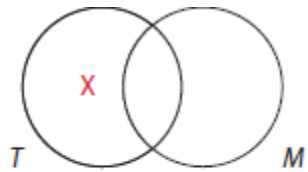


If the information expressed by the conclusion diagram is contained in the premise diagram, the argument is **valid;** if not, it is **invalid**. Here is the symbolized form of the trade spies inference that we tested earlier.

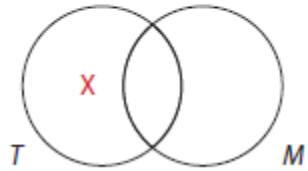
Some T are not M.
Therefore, it is false that all T are M.

The next step is to draw two Venn diagrams, one for the premise and the other for the conclusion. For the premise we enter an X in the left -hand part of the *T* circle, and for the conclusion, as we have just seen, we enter an X in the left -hand part of the *T* circle:

Some *T* are not *M*.



It is false that all *T* are *M*.



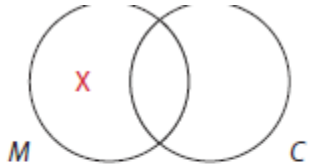
To evaluate the inference, we look to see whether the information expressed by the conclusion diagram is also expressed by the premise diagram. The conclusion diagram asserts that something exists in the left -hand part of the *T* circle. Since this information is also expressed by the premise diagram, the inference is **valid**. In this case, the diagram for the conclusion is identical to the diagram for the premise, so it is clear that premise and conclusion assert exactly the same thing.

Here is the symbolized version of the second inference evaluated earlier:

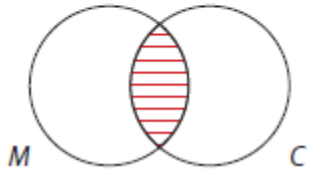
It is false that all M are C.
Therefore, no M are C.

To diagram the premise, we enter an X in the left -hand part of the *M* circle, and for the conclusion we shade the overlap area:

It is false that all *M* are *C*.



No *M* are *C*.



Here, the conclusion diagram asserts that the overlap area is empty. Since this information is not contained in the premise diagram, the inference is **invalid**. We conclude with a special kind of

inference that: the information of the conclusion diagram is not contained in the premise diagram, so the inference is **invalid**. However, if the premise were interpreted as having existential import, then the *C* circle in the premise diagram would not be empty. Specifically, there would be members in the overlap area. This would make the inference valid.

Arguments of this sort are said to commit the existential fallacy. From the Boolean standpoint, the **existential fallacy** is a formal fallacy that occurs whenever an argument is invalid merely because the premise lacks existential import. Such arguments always have a universal premise and a particular conclusion. The fallacy consists in attempting to derive a conclusion having existential import from a premise that lacks it.

The existential fallacy is easy to detect. Just look for a pair of diagrams in which the premise diagram contains shading and the conclusion diagram contains an X. If the X in the conclusion diagram is in the same part of the left -hand circle that is unshaded in the premise diagram, then the inference commits the existential fallacy. In the example we just considered, the premise diagram contains shading, and the conclusion diagram contains an X. Also, the X in the conclusion diagram is in the overlap area, and this area is unshaded in the premise diagram. Thus, the inference commits the **existential fallacy.** All of these forms proceed from a universal premise to a particular conclusion.
Existential fallacy:

All A are B.
Therefore, some A are B.
It is false that some A are not B.
Therefore, it is false that no A are B.
No A are B.
Therefore, it is false that all A are B.
It is false that some A are B.
Therefore, some A are not B.

Finally, while all of these forms proceed from a universal premise to a particular conclusion, it is important to see that not every inference having a universal premise and a particular conclusion

commits the existential fallacy. For example, the inference "All *A* are *B*; therefore, some *A* are not *B*" does not commit this fallacy. This inference is invalid because the conclusion contradicts the premise. Thus, to detect the existential fallacy, one must ensure that the invalidity results merely from the fact that the premise lacks existential import. This can easily be done by constructing a Venn diagram.

4.1 Logical Operations: Conversion, Obversion, and Contraposition

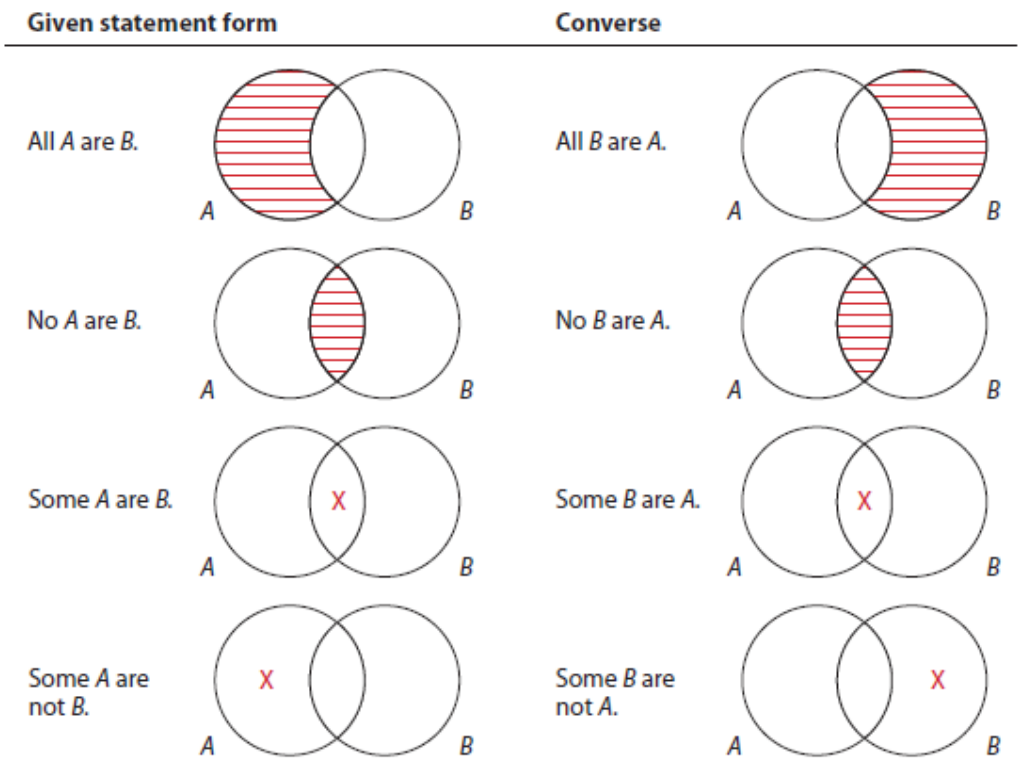
Dear students, Conversion, Obversion, and Contraposition are operations that can be performed on a categorical proposition, resulting in a new statement that may or may not have the same meaning and truth value as the original statement. Venn diagrams are used to determine how the two statements relate to each other.

❖ Conversion

Conversion-the rule of conversion emphasizes the change of the position of the subject to the predicate and vice versa. Accordingly, by conversion the four propositions look like the following. Study the following table.

Letter Name	*Given Proposition*	*New statement by conversion*
A	*All S are P*	*All P are S*
E	*No S are P*	*No P are S*
I	*Some S are P*	*Some P are S*
O	*Some S are not P*	*Some P are not S*

The simplest of the three operations is **conversion,** and it consists in switching the subject term with the predicate term. For example, if the statement "No foxes are hedgehogs" is converted, the resulting statement is "No hedgehogs are foxes." This new statement is called the *converse* of the given statement. To see how the four types of categorical propositions relate to their converse, compare the following sets of Venn diagrams:



According to the rule of conversion:

Propositions E and I always gives the same truth-value. Hence, we can form a valid conversion from the two propositions, taking the given proposition as premise and the converted one as conclusion. If the given proposition is true, then the new converted proposition will be again true. If the premise is false, then the conclusion will be false too. Symbolically:

No S are P = No P are S

Some S are P = Some P are S

Both propositions are equivalent and give us the same truth-value.

Example 1:

No birds are featherless (T) = given. No featherless are birds (T) = New (converted)

Based on the given and converted true statements we can form valid immediate inference. Immediate inference is an argument consisting of only one premise and one conclusion.

Accordingly, the above propositions form a valid argument:

- Since no birds are featherless, therefore no featherless are birds.
- In other words, we can state this assumption by saying that

No birds are featherless, it implies that no featherless are birds.

The same is true for proposition I .

Some businesses are profitable = True (given)

Some profitables are businesses = True (converted)

However, proposition A and O would not give us the same truth-value always as in the case of proposition E and I. The truth-value of the converted statements of A and O are undetermined, that is, sometimes it gives us the same truth-value as the truth-value of the given proposition, in another occasion they can give us a different truth-value than a given proposition.

Example 1: In proposition 'A'

A. All men are mortal - True

All mortals are men = False which is different in truth value from the given proposition.

B. All Muslims are Christians = False

All Christians are Muslims = False – which is the same truth value as the given proposition.

2. In Proposition (I)

A. Some athletes are not drug users = True

Some drug users are not athletes = True, same

B. Some Ethiopians are not Africans = False

Some Africans are not Ethiopians = True , different

These examples clearly show that we cannot form valid arguments form propositions A and O

Activity # 2 Dear students, do you remember how a deductive argument is evaluated as valid or invalid?

We have the confidence in you that, you did not forget the two basic factors for an argument to be invalid:

1. When the premise is true and the conclusion is false
2. When the premise become unsupportive and irrelevant to the claims of the conclusion:

Based upon these two requirements the immediate fallacies of propositions A and O in conversion:

- Would give us inconsistent truth values
- The information content of the premise is unsupportive and not harmonious to the conclusion

Dear learners,

Do you know about fallacies? You have to know that fallacies are mistakes committed in arguments which deludes us into thinking that the mistaken argument as correct one. They are classified as formal and informal fallacies. Informal fallacies can be detected by examining the logical problem in the argument, while formal fallacies can be known simply by their logically incorrect forms that are by the position of terms, quantifiers and statements. The diagram for the **A** statement is clearly not identical to the diagram for its converse, and the diagram for the **O** statement is not identical to the diagram for its converse. Also, these pairs of diagrams are not the exact opposite of each other, as is the case with contradictory statements. This means that an **A** statement and its converse are logically unrelated as to truth value, and an **O** statement and its converse are logically unrelated as to truth value. In other words, converting an '**A**' or '**O**' statement gives a new statement whose truth value is logically undetermined in relation to the given statement. The converse of an **A** or **O** statement does have a truth value, of course, but logic alone cannot tell us what it is. Because conversion yields necessarily determined results for **E**

and **I** statements, it can be used as the basis for immediate inferences having these types of statements as premises. The following inference forms are valid:

No A are B.
Therefore, no B are A.
Some A are B.
Therefore, some B are A.

Since the conclusion of each inference form necessarily has the same truth value as the premise, if the premise is assumed true, it follows necessarily that the conclusion is true. On the other hand, the next two inference forms are invalid. Each commits the fallacy of **illicit conversion:**

All A are B.
Therefore, all B are A.
Some A are not B.
Therefore, some B are not A.

Here are two examples of inferences that commit the fallacy of illicit conversion:

All cats are animals. (True)
Therefore, all animals are cats. (False)
Some animals are not dogs. (True)
Therefore, some dogs are not animals. (False)

Accordingly, the immediate inferences of proposition A and O in the case of conversion are invalid and the formal fallacy committed in the invalid arguments of these propositions is called **illicit conversion**. It is a logically incorrect conversion; hence, it is named as illicit conversion.

- **Obversion** The logical rule of obversion has two steps:

  a. Change the quality without changing its quantity

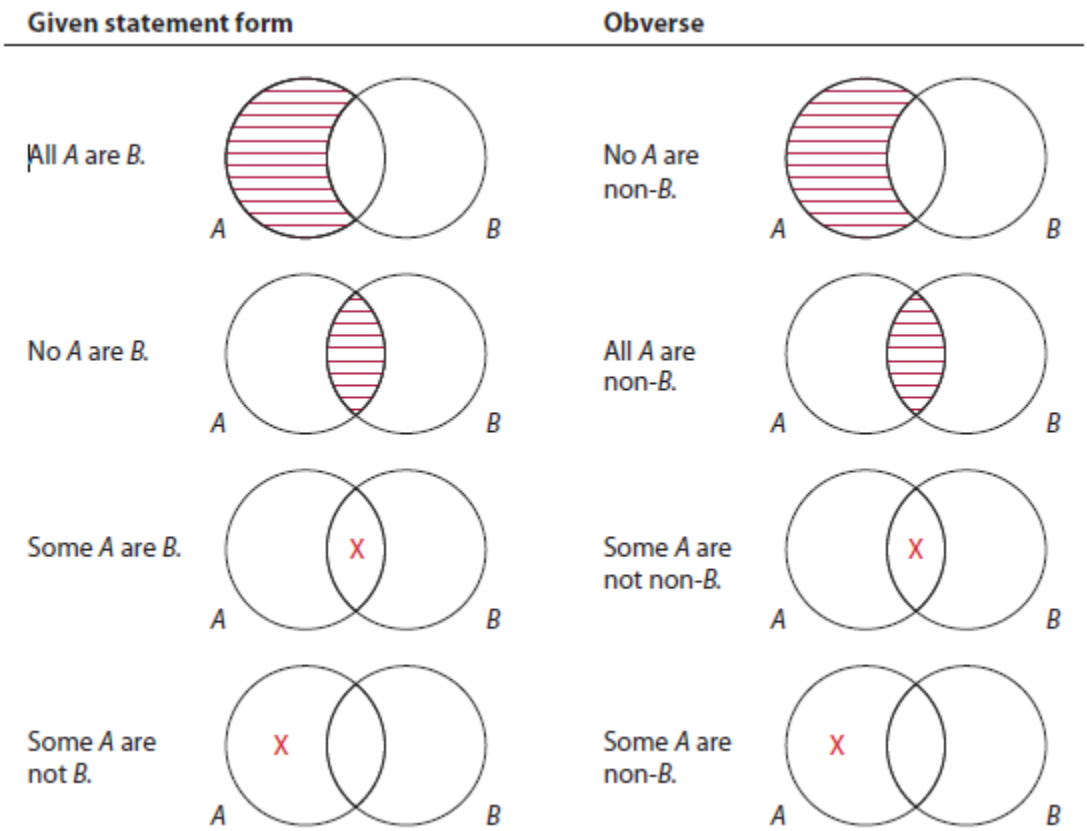
  b. Change the predicate by its term complement. A term which has opposite meaning against the meaning of a given term is called term complement. A term

complement for black is white, and for the term Ethiopians is non-Ethiopians or those that are not Ethiopians.

Study the following tabular demonstration:

Letter Name	*Given Proposition*	*New Statement* *By Obversion*
A	*All S are P*	*No S are non-P*
E	*No S are P*	*All S are non-P*
I	*Some S are P*	*Some S are not non-P*
O	*Some S are not P*	*Some S are non –P*

We now have everything we need to form the *obverse* of categorical propositions. First, we change the quality (without changing the quantity), and then we replace the predicate term with its term complement. For example, if we are given the statement "All horses are animals," then the obverse is "No horses are non-animals"; and if we are given the statement "Some trees are maples," then the obverse is "Some trees are not non-maples." To see how the four types of categorical propositions relate to their obverse, compare the following sets of Venn diagrams:



Do you understand how the standard forms of the four propositions are obverted? To make the first rule of obversion, change the quality without changing its quantity. The affirmative quantifier "all "has to be replaced by the negative quantifier "no." This is to change the affirmative quality of the proposition into negative quality. And again the quantity of these propositions are universal, that is the propositions that begins by "All S are "and "No S are" are both universal in quantity.

3. The affirmative proposition "some S are "should be replaced as "some S are not" for the purpose of changing its quality. Besides, the predicate should be replaced by its opposite term, which has different meaning than a given term, symbolically represented as "non-P". According to the rule of obversion, all the four propositions would give us the same truth-value as it is in the given proposition. This is to mean that if the given proposition is true, like for example, all S are P is true, then the new obverted statement, No S are non-P, is also be true. If the given proposition is false, the new obverted statement will be false too. It is the same for all propositions. <u>Example:</u> I = Some student are clever. (True)

Some students are not lazy. (True) by obversion.

E= No leaders are liars (False

All leaders are honest. (False)

Since the truth value of the given and obverted statement have the same truth-value and the information content of the two propositions are the same, if we consider the given proposition as premise and the obverted statement as conclusion, the immediate inference is always valid, hence commits **no formal fallacy**. The following inference forms are valid:

All A are B.
Therefore, no A are non-B.
No A are B.
Therefore, all A are non-B.

Some A are B.
Therefore, some A are not non-B.
Some A are not B.
Therefore, some A are non-B.

Because the conclusion of each inference form necessarily has the same truth value as its premise, if the premise is assumed true, it follows necessarily that the conclusion is true.

- **Contraposition**

According to the rule of contraposition, we have to change the position of the subject to the predicate and vice versa; and, we should to replace the predicates and the subject terms by their term complements.

Study the following table.

Latter Name	*Given Proposition*	*New statement by Contraposition*
A	*All S are P*	*All non-S are non-P*
E	*No S are P*	*No non- S are non-P*
I	*Some S are P*	*Some non- S are non –P*
O	*Some S are not P*	*Some non –S are not no –P*

According to the rule of contraposition, proposition 'A' and 'O' would give us the same truth value, while proposition E and I do not. This is just the opposite of what we have observed in the case of conversion. Please the following contrapositions.

A = All worshipers are believers = True

All non- believers are non- worshipers = True

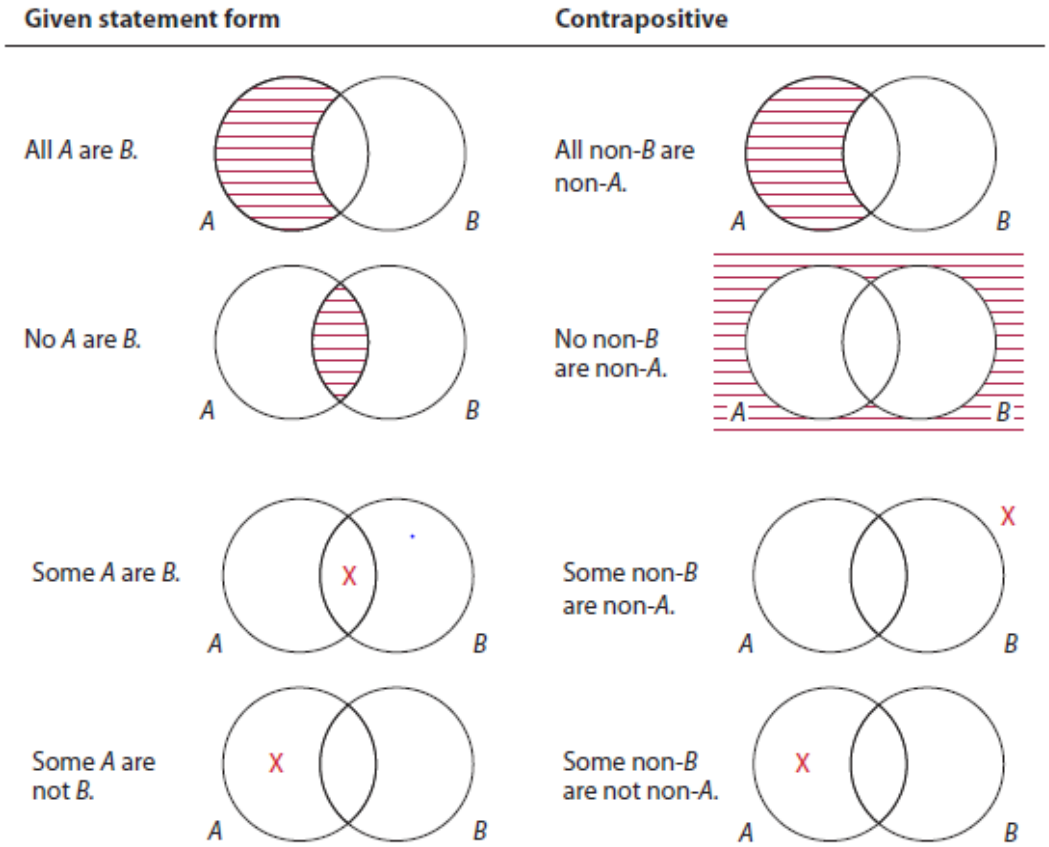
When it is correctly phrased:-

All atheists are un worshipers

O = Some delicious foods are not good for health = True

Some that are bad for health are bad foods = True

Like obversion, contraposition requires two steps: (1) switching the subject and predicate terms and (2) replacing the subject and predicate terms with their term complements. For example, if the statement "All goats are animals" is contraposed, the resulting statement is "All non-animals are non-goats." This new statement is called the contrapositive of the given statement. To see how all four types of categorical propositions relate to their contrapositive, compare the following sets of diagrams:



As with conversion and obversion, contraposition may provide the link between the premise and the conclusion of an immediate inference. The following inference forms are valid:

All A are B.

Therefore, all non-B are non-A.

Some A are not B.

Therefore, some non-B are not non-A.

On the other hand, the following inference forms are invalid. Each commits the fallacy of illicit contraposition:

Some A are B.

Therefore, some non-B are non-A.

No A are B.

Therefore, no non-B are non-A.

Here are two examples of inferences that commit the fallacy of illicit contraposition:

No dogs are cats. (True)

Therefore, no non-cats are non-dogs. (False)

Some animals are non-cats. (True)

Therefore, some cats are non-animals. (False)

Note that both illicit conversion and illicit contraposition are formal fallacies: They can be detected through mere examination of the form of an argument.

Chapter Summary

A proposition that relates two classes, or categories, is called a categorical proposition. The classes in question are denoted respectively by the subject term and the predicate term, and the proposition asserts that either all or part of the class denoted by the subject term is included in or excluded from the class denoted by the predicate term. To put the same ideas in different words, a categorical proposition is a statement that relates two sets, classes, groups or categories which are presented in their subject or predicate positions that could be connected based on inclusion (partial/whole) or exclusion (partial/whole) relations. In this chapter, you have, also, learnt the different components of categorical proposition, the difference between modern and traditional square of opposition and how to evaluate arguments/inferences using different propositional representation.

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Self-Check Exercises

Dear learners, please attempt the following Questions.

1. What is the significance of determining categorical propositions in standard form?
   _____
   _____

2. What problems would occur if categorical propositions are not settled in standard form?
   _____

3. Write a categorical proposition in which its quantifier is "No".
_____

4. Write a categorical proposition in which its quantifier is "some", its subject term "soldier" and predicate term "cowards" and its copula "are not"
   _____

5. If a categorical proposition states that "there is at least one X and that X is in Y", its symbolic representation will be
   _____

6. The standard form of "All S are not P" is not a correct standard form.
   Why?_____

7. Write a categorical statement in which its subject class is entirely included in the predicate class.

_____

I. Draw Venn diagrams for the following propositions.

1. Some rock-music lovers are not fans of Madonna.
3. Some housing developments are complex that exclude children

II. Use the modern square of opposition to determine whether the following immediate inferences are valid or invalid from the Boolean standpoint.

1. Some country doctors are altruistic healers.

Therefore, some country doctors are not altruistic healers.

2. It is false that all weddings are light-hearted celebrations. Therefore, some weddings are not light-hearted celebrations.

III. Convert the following propositions and state whether the converse is logically equivalent or not logically equivalent to the given proposition.

a. All hurricanes are storms intensified by global warming.
b. No sex-change operations are completely successful procedures

V. **Obvert the following propositions and state whether the obverse is logically equivalent or not logically equivalent to the given proposition.**

a. All radically egalitarian societies are societies that do not preserve individual liberties.
b. No cult leaders are people who fail to brainwash their followers.

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