Session 8 – DEDUCTION VS. INDUCTION (PART 1)

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Session Overview

• Students will be thought how arguments are constructed in the forms of deduction and induction. This will be done in order to teach them the requirements of these arguments for intellectual acceptability.

• **Goals and Objectives**

  At the end of the session, the student will

  1. Be able to distinguish bad and good ways of distinguishing between deductive and inductive arguments.

  2. understand the difference between particular and general statements.

  3. Understand the difference between reference class and attribute class of a statement.
The key topics to be covered in the session are as follows:

• Topic One: **ARGUMENT.**

• Topic Two : **THE TWO TYPES OF STATEMENT THAT APPEAR IN ALMOST EVERY ARGUMENT**
  
  (a) Particular Statement
  
  (b) General Statement

• Topic Three: **THE TWO TYPES OF ARGUMENT**
  
  (a) Deductive Argument
  
  (b) Inductive Argument
Reading List

• Log onto the UG Sakai LMS course site: http://sakai.ug.edu.gh/xxxxxxxxxx
• Read Unit 6 of Recommended Text – pages 100-111
• Watch the Videos for session 8-Deduction vs. Induction (Part 1)
• Visit the Chat Room and discuss the Forum question for session 8 (Part 1)
Topic One

ARGUMENT
What is an ARGUMENT.

• In session 5, we were introduced to an argument as a passage that is made up statements with premises and one conclusion.

• The premises are the reasons or justifications that support the conclusion. And the conclusion is the claim or belief or opinion of the person making the argument.

• Examples:

  1. All professional football players are rich. Essien is a professional football player.

     Therefore **Essien is rich.** (conclusion)
2. Two independent witness claim they saw John commit the murder. John’s finger prints are all over the murder weapon and John himself confessed to the crime. So we can conclude that John committed the murder. (Conclusion)

3. For all the number of times that teachers had gone on strike. It has been because the government has refused to pay their research and book allowances. This year, government mentioned that as part of the changes to be made in the educational sector, the book and research allowances will be “taken off” the educational budget. So I foresee a strike action taking place before the year ends. (Conclusion)
THE TWO TYPES OF STATEMENT THAT APPEAR IN ALMOST EVERY ARGUMENT.
A statement can be defined as a sentence that can either be true or false.

The premises and conclusion of an argument are all expressed in the form of statements. However, the nature of the statements are such that they come in two forms. The PARTICULAR STATEMENT and The GENERAL STATEMENT.

But for a statement to be particular or general its REFERENCE CLASS must first be determined.
What then is the REFERENCE CLASS of a statement.

• Every statement has two parts.
• The reference class:- this the grammatical subject of the statement.

  E.g. 1. Joshua and Kofi are reading in the library.

  2. A small group of taxi drivers in Accra can speak Chinese.

• The attribute class:- this is the attribute or property or action that the statement tells us about the subject.( the predicate of the statement)

• E.g. 1. Joshua and Kofi are reading in the library.

  2. A small group of taxi drivers in Accra can speak Chinese.
Continuation

• However, **it is the reference class part**, of every statement that *determines the type of statement*.

• **A PARTICULAR STATEMENT** is a statement with a *finite(countable) reference class(subject)*

• Examples:
  1. **Joshua and Kofi** are reading in the library ( *two individuals*)
  2. **The water in this person’s bucket** is finish. ( *one person’s bucket*)
  3. **Accra** is filthy. ( *one city*)
  4. **All the students in this class** are Distance education students.
(we can get to know the total number of the students in the class). Thus they are all particular statement because their reference classes are countable (finite).

• A GENERAL STATEMENT on the other hand is a statement with an infinite (uncountable) reference class (subject).

• Examples:
  1. A small group of taxi drivers in Accra can speak Chinese.
  2. All students are distance education students.
  3. No human being can fly.
  4. Some Ghanaians have not travelled before.
  5. All students from University of Ghana read critical thinking.
We cannot count to know the total number of each reference class from the above examples. In e.g1 we cannot tell the exact number of small taxi drivers in Accra whether 20, 30, 60, 100, or 200. In e.g2 we cannot count the total number of students. It refers to students anywhere as well as those who are yet to become students. So it is infinite. The same can be said of e.g3 and e.g5. In e.g4 how many Ghanaians are “some”. The “some” can be half the population of Ghana or a quarter so it is also infinite.

- NB. Thus the two types of statement are particular and general statement. And very often the premises and the conclusion of any argument comprise these two types of statement. However note that they are not what makes a passage an argument but rather the presence of premises and conclusion.
THE TWO TYPES OF ARGUMENT
The two types of argument are *deductive argument* and *inductive argument*. But before we look at what they essentially are, let’s consider the inappropriate or wrong way to define an inductive argument and deductive argument.

*The mistaken way of distinguishing an inductive argument from deductive argument is to define* inductive argument as:

the type of argument that moves from particular statements as premises to a general statement as conclusion. E.g.

1. I saw ten vandals and they were all wearing red. *(particular statement)* *premises*. So I can conclude that *all vandals wear red*.* (general statement) conclusion.*
• And define **Deductive argument** as the type of argument that moves from general statement as premises to particular statement as conclusion.

• E.g.

  1. All vandals wear red. (general statement) **premise**

     Ten vandals are visiting me today. (particular statement) **premise**

     So **they must wear red**. (particular statement) **conclusion**

• **NB.** To define inductive and deductive this way is to claim that all inductive and deductive arguments look like this always. But this is false because not all inductive and deductive arguments look like this. The above definitions are too narrow.
• In fact, Some deductive arguments move from particular premises to particular conclusion as well as general premises to general conclusions and also some inductive arguments move from general premises to particular conclusions.

• What then is the correct way to distinguish deductive arguments from inductive arguments? In another words, what makes an argument deductive and what makes an argument inductive?
A deductive argument is an argument where the conditions that ensures the truth of the premises require that the conclusion will also be true. This means that the conclusion of deductive argument is the logical consequence of the premises such if one assumes the premises to be true and deny the conclusion, it will result in a contradiction. If the premises are taken to be true the conclusion cannot be false. So we say that in a deductive argument, the premises prove, guarantee or contain the conclusion.

The test is to ask yourself if you assume the premises of the argument to be true, can you deny the conclusion? If your answer is NO then the argument is DEDUCTIVE.
EXAMPLE

1. All animals that live on trees can fly. (premise)
   All birds live on trees. (premise)
   So All birds can fly (conclusion)

2. Ama is older than Yaw. (premise)
   Yaw is older than Abena. (premise)
   it follows then that Ama is older than Abena. (conclusion)

3. All footballers are rich. (premise)
   All rich people are hard working. (premise)
   So all footballers are hard working. (conclusion)

4. All politicians are dishonest. (Premise)
   Muhammad is a politician. (premise)
   So Muhammad is dishonest. (conc)
• From the above example it can be seen that it is impossible for one to assume the premises to be true and deny the conclusion because doing so will result in contradiction.

• From E.g2. if it is true that “Ama is older that yaw”, and it is also true that, “Yaw is older than Abena” can you conclude therefore that “Ama is not older than Abena”? THE ANSWER IS NO. so the above E,g2 is a deductive argument, and the rest all are. That is how you identify a deductive argument.

• NB: If you observe carefully you can see that the movement from premises to conclusion is not the same for all the arguments but they are all deductive arguments because if their premises are taken to be true the conclusion cannot be false.
An inductive argument on the other hand is an argument where the premises provide good reasons or evidence to believe the conclusion will be true. The premises do not prove the conclusion to be true like the way it is in the case of deductive but rather the premises confirms the likelihood or probability of the conclusion being true depending on how good the evidence or information provided in the premises are. This means that for inductive arguments the premises can be true and the conclusion will be false without any contradiction.

The test is to ask yourself, is it possible for the conclusion to be false even when the premises are true?. If you answer YES, THEN THE ARGUMENT IS INDUCTIVE.
EXAMPLES

EXAMPLE 1 AND 2

1. Some footballers are hardworking. (premises)
   Jordan Ayew is a footballer. (p)
   Therefore, *Jordan Ayew is hardworking* (conclusion)

2. All the 5 Miss Malaika winners are from Volta hall and they are all very pretty. (premises)
   So, *the next Volta hall lady that will win the Miss Malaika will also be very pretty.* (conclusion)

EXAMPLE 3

3. Two independent witness claim they saw John commit the murder. John’s finger prints are all over the murder weapon and John himself confessed to the crime. So *we can conclude that John committed the murder.* (conclusion)
• From the above example if we do the test we will realize that it is possible for the premises to be true and conclusion to be false. Hence they are all inductive.

• From E.g1, the fact that Jordan Ayew is a footballer does not guarantee that he is hardworking because the first premise says some footballers are hardworking not all of them. So it is inductive. In E.g2, it also possible that the next Volta lady that wins The Miss Malaika will not be very pretty even when the premises are true. If the next Volta lady that wins The Miss Maliaka happens to be very pretty, that will still not guarantee that the next Volta lady that wins will be very pretty and on and on and on. So it is also inductive.
• In E.g3 also, the conclusion **John committed the murder** can be **false** even when the premises are true. What if john is covering up the murder case for the girlfriend so he wipes of the girlfriend’s finger prints and puts his own there and confesses convincingly that he committed the murder. *Then it will mean that in actual sense he did not commit the murder and that will make the conclusion false*. Or maybe he is framed for the crime; someone planted his finger prints on the murder weapon and those two independent witness are hired witness. *That will also make the conclusion false as well*.

• **NB**: So now you can tell the difference between inductive arguments and deductive arguments. **DEDUCTION IS AN ARGUMENT OF PROOF OR CERTAINTY WHILST INDUCTIVE IS AN ARGUMENT OF CONFIRMATION.**