

PROFESSIONAL STANDARDS

Inductive versus Deductive Teaching

Introduction

Deductive teaching

In most high schools and tertiary institutions in Tonga, teaching is carried out deductively. Deductive teaching is based on the idea that optimal learning takes place when the content to be taught are highly structured and carefully presented. In such an approach, a generalisation (e.g. theory or equation) is presented and then students are carefully guided in practicing and applying their understanding until they master the target ideas. Generally, deductive teaching primarily aims at students verifying or demonstrating an idea that has been learnt.

In deductive teaching, the students have already been introduced to the ideas in lectures. 'Follow-up' activities with specific examples are then used to consolidate or verify what the students have already learnt.

In deductive teaching, the only motivation that students have to learn new ideas, (beyond marks and grades) is the hazy promise that they will be important in their careers. And when such an incentive fails to motivate students, the teacher then resorts to the usual bullying tactic of telling students that 'This is important because it is going to come in the examination'.

Many teachers prefer deductive teaching because of its clear and apparent structure. And as a result, many students prefer this approach because it is the only teaching method they are familiar with. However, the rigidity of deductive teaching does not allow for divergent student thinking, and badly fails to promote higher order skills such as critical reasoning and problem solving.

If the paramount purpose of education is to prepare students to be able to adapt to the complexity of the world beyond the school, we must use teaching strategies which would provide them with the necessary skills to do so.

Inductive Teaching

A better way to teach is through inductive teaching. This approach is based on the constructivist belief that knowledge is constructed by learners when they experience phenomena first hand. In such an approach, the teacher begins the lesson by presenting students with some examples or a specific challenge (e.g. experimental data, a case study, or a set of diagrams) to analyse or to interpret, etc. The students are then encouraged to observe patterns, raise questions, or construct theories based on their observation.

[Type text]

As students wrestle with the challenge at hand, they quickly recognise the need for facts, skills, and conceptual understanding. At this point, the teacher then skilfully provides additional information to facilitate the students' construction of their own understanding.

Inductive teaching methods come in many forms, including inquiry-based learning, discovery-learning, problem-based learning, case study-based learning, and project-based learning. There are numerous studies that provide strong support for inductive teaching in the classroom. These studies show that inductive teaching:

- i. improve long-term retention of concepts;
- ii. improves perseverance and encourages students to adopt a deep approach to learning;
- iii. improve problem solving skills;
- iv. encourages open-mindedness;
- v. promotes original and divergent thinking
- vi. allows students to discover ideas for themselves

Through inductive learning, our students will also understand that new knowledge is ONLY produced when they are able to observe what others have not observed, ask questions no one has thought to ask, try things no one has thought to try, make inferences no one has thought to make, sort things in ways no one has sorted them, and focus less on "right" answers and more on "sensible" answers.

Teaching inductively is a challenge to many teachers. These challenges range from having difficulty in getting students to start and understand their roles in the activity, to maintaining focus and the obvious time-consuming nature of inductive activities. However, in order for inductive strategies to succeed, it is imperative that the teacher creates clear guidelines for behaviour, provides explicit directions at the beginning of the activity, and be constantly prepared to offer assistance when necessary.

In this session, you will have the opportunity to learn more about inductive teaching.

Exercise

1. Observe the demonstrations carefully, and record your observations.
2. For each demonstration, construct a theory to explain your observations.
3. Provide evidence to support your theory.