LESSON 3.0 – SCIENCE and TECHNOLOGY in NATION BUILDING
3.3 Selected Indigenous Science and Technology
Introduction

This lesson focuses on indigenous science and technology in the Philippines. Filipinos, especially during the early times, tried to invent tools that will help them in everyday life. They also developed alternative ideas in explaining various phenomena and in explaining the world around them. This system of knowledge is called indigenous knowledge, which is the foundation of indigenous science.

INTRODUCTION

This lesson discussed the concept of indigenous knowledge and its influence on the development of indigenous science. The communities in the Philippines have maintained vast amounts of indigenous knowledge, cultural practices, traditions, and beliefs. These include beliefs and practices ranging from different areas such as health, environment, peace and order, agriculture, food production, astronomy, music, and literature. The indigenous knowledge system of the people served as the foundation for the development of indigenous science.

Even before the time of the Spanish colonization in the Philippines, various people and communities already practiced science. They invented tools and built structures, studied the medicinal uses of plants, observed heavenly bodies to predict seasons and weather, and used indigenous science in agriculture. These are considered indigenous science, which is one of the foundations of modern science.

Indigenous Knowledge System

The communities in the Philippines have maintained vast amounts of indigenous knowledge, cultural practices, traditions, and beliefs. These include beliefs and practices ranging from different areas such as health, environment, peace and order, agriculture, food production, astronomy, music, and literature. The indigenous knowledge system of the people served as the foundation for the development of indigenous science.

Indigenous knowledge is embedded in the daily life experiences of young children as they grow up. They live and grow in a society where the members of the community prominently practice indigenous knowledge. Their parents and other older folks served as their first teachers and their methods of teaching are very effective in transmitting cultural knowledge in their minds. The lessons they learned are intimately interwoven with their culture and the environment. These lessons comprised of good values and life stories of people on their daily life struggles. Their views about nature and their reflections on their experiences in daily life are evident in their stories, poems, and songs.

Some examples of indigenous knowledge that are taught and practiced by the indigenous people are:

1. Predicting weather conditions and seasons using knowledge in observing animals' behavior and celestial bodies.
2. Using herbal medicine.
3. Preserving foods.
4. Classifying plants and animals into families and groups based on cultural properties.
5. Preserving and selecting good seeds for planting.
6. Using indigenous technology in daily lives.
7. Building local irrigation systems.
8. Classifying different types of soil for planting based on cultural properties.
9. Producing wines and juices from tropical fruits; and
10. Keeping the custom of growing plants and vegetables in the yard.

Indigenous Science

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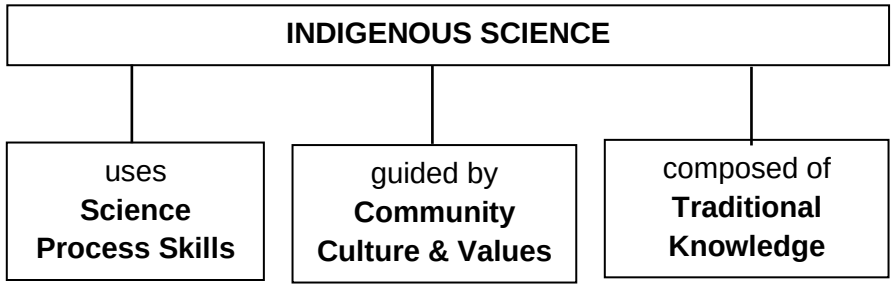
Indigenous science is part of the indigenous knowledge system practiced by different groups of people and early civilizations (Gribbin, 2001; Mkapa, 2004; Sibisi, 2004). It includes complex arrays of knowledge, expertise, practices, and representations that guide human societies in their enumerable interactions with the natural milieu: agriculture, medicine, naming and explaining natural phenomena, and strategies for coping with changing environments (Pawilen, 2005). Ogawa (1995) claimed that it is collectively lived in and experienced by the people of a given culture.

According to Cajete (2004), indigenous science includes everything, from metaphysics to philosophy and various practical technologies practiced by indigenous peoples both past and present. Iaccarino (2003) elaborated this idea by explaining that science is a part of culture, and how science is done largely depends on the cultural practices of the people.

Indigenous beliefs also develop desirable values that are relevant or consistent to scientific attitudes as identified by Johnston (2000), namely: (1) motivating attitudes; (2) cooperating attitudes; (3) practical attitudes; and (4) reflective attitudes. These cultural beliefs therefore can be good foundation for developing positive values toward learning and doing science and in bringing science in a personal level.

Pawilen (2005) explained that indigenous science knowledge has developed diverse structures and contents through the interplay between the society and environment. According to Kuhn (1962), developmental stages of most sciences are characterized by continual competition between a number of distinct views of nature, each partially derived from, and all roughly compatible with the dictates of scientific observation and method. Sibisi (2004) also pointed out that indigenous science provides the basics of astronomy, pharmacology, food technology, or metallurgy, which were derived from traditional knowledge and practices.



Pawilen (2006) developed a simple framework for understanding indigenous science. Accordingly, indigenous science is composed of traditional knowledge that uses science process skills and guided by community values and culture.

1. Indigenous science uses science process skills such as observing, comparing, classifying, measuring, problem solving, inferring, communicating, and predicting.
2. Indigenous science is guided by culture and community values such as the following:
    - 2.1. The land is a source of life. It is a precious gift from the creator.
    - 2.2. The Earth is revered as “Mother Earth.” It is the origin of their identity as people.
    - 2.3. All living and nonliving things are interconnected and interdependent with each other.
    - 2.4. Human beings are stewards or trustee of the land and other natural resources. They have a responsibility to preserve it. 2.5 Nature is a friend to human beings – it needs respect and proper care.

3. Indigenous science is composed of traditional knowledge practiced and valued by people and communities such as ethno biology, ethno-medicine, indigenous farming methods, and folk astronomy.

Indigenous science is important in the development of science and technology in the Philippines. Like the ancient civilizations, indigenous science gave birth to the development of science and technology as a field and as a discipline. Indigenous science helped the people in understanding the natural environment and in coping with everyday life. UNESCO's Declaration on Science and the Use of Scientific Knowledge (1999) recognized indigenous science as a historical and valuable contribution to science and technology.