Chapter 1
Inquiry-Based Learning: Encouraging Exploration and Curiosity in the Classroom

Ahmad Qablan
https://orcid.org/0000-0002-2780-9796
United Arab Emirates University, UAE

Ahmed Alkaabi
https://orcid.org/0000-0001-7220-8087
United Arab Emirates University, UAE

Mohammed Humaid Aljanahi
https://orcid.org/0000-0001-9982-7179
United Arab Emirates University, UAE

Suhair A. Almaamari
Emirates Schools Establishment, UAE

ABSTRACT

Inquiry-based learning is an approach to learning that encourages students to engage in problem-solving through exploration and high-level questioning. It incorporates active participation of students by involving them in posing questions and bringing real-life experiences to them. The basis of this approach is to channelize the students' thought process through queries and help them in "how to think" instead of "what to think." This chapter begins by defining constructivism as the theoretical origin of inquiry-based learning, it then moves to talk about the benefits and advantages of this approach on students' learning. It also discusses the multiple forms of inquiry-based learning that have been documented in the literature to increase student involvement in their learning. The chapter demonstrates the various types of inquiry-based learning that can be implemented to drive the teaching process.

DOI: 10.4018/979-8-3693-0880-6.ch001

INTRODUCTION

The constructivist view of learning profoundly influences our understanding of teaching and learning. Tobin (1993) highlighted constructivism as a paradigm shift in educational thought, describing learning as a dynamic, social process where learners actively constructed meaning based on their prior knowledge. Social constructivism, further elaborated by Driver et al. (1994), emphasizes the essential role of social settings in learning, which suggests that knowledge is constructed through interactions in educational environments (Ullrich, 1999). Constructivists advocate for teaching methods that enable students to connect their prior knowledge with new information, while considering their diverse backgrounds and experiences in the process (Bullough, 1994; Ullrich, 1999). The adoption of constructivism and inquiry-oriented teaching is widely supported by educators (Abd-El-Khalick et al., 2004; National Research Council, 2000; Slavin, 1994; Stofflett & Stoddart, 1994). They argue that these methods stimulate students' conceptual understanding by encouraging them to build on their existing knowledge and actively engage with new information, applying their learning in real-life contexts.

Despite varying interpretations of inquiry in education, many educators agree on its core elements. As Howes et al. (2008) suggested, inquiry in the classroom involves "doing what scientists do." This view aligns with the National Science Education Standards (National Research Council, 1996), which defined inquiry as:

A multifaceted activity that involves making observations; posing questions; examining books and other sources of information to see what is already known; planning investigations; reviewing what is already known in light of experimental evidence; using tools to gather, analyze and interpret data; proposing answers, explanations, and predictions; and communicating the results. (p. 1)

The literature documents several benefits of inquiry-based teaching and learning. Lord and Orkwiszewski (2006) argued that it effectively improved students' content knowledge, scientific process skills (Deters, 2005; Hofstein et. al., 2004), attitudes toward learning, motivation (Tuan et al., 2005), and communication skills (Deters, 2005).

ESSENTIAL FEATURES OF INQUIRY TEACHING

The inquiry process adopts a scientific methodology, beginning with the formulation of questions about scientific phenomena and seeking answers to these queries. This approach enables learners to develop various skills, including scientific skills like critical thinking and problem-solving, as well as communication skills encompassing collaboration and idea sharing. The literature highlights five key features of science inquiry that aid students in understanding the methods scientists use to acquire knowledge (National Research Council, 2000).

Learners are Engaged by Scientifically Oriented Questions

Scientific questions often stem from observations of objects, organisms, and events in nature. These questions are central to inquiry, leading to empirical investigations and the use of data to explain in-