Science Education

M.C. Linn, in International Encyclopedia of the Social & Behavioral Sciences, 2001

Recent research in science education brings to life the systemic, complex nature of science teaching and learning. Partnerships of classroom teachers, science educators, natural scientists, technologists, and policy makers are jointly designing innovative instruction, continually refining it based on classroom studies, and developing a more robust perspective on science teaching and learning. Most agree that science learners engage in a process of knowledge integration where they make sense of diverse information including their own experiences, classroom instruction, and related ideas rather than absorb information from courses. Recent research provides guidance to curriculum designers by describing the interpretive, cultural, and deliberate dimensions of knowledge integration. Frameworks for design of science instruction foster knowledge integration by calling for materials and activities that feature accessible ideas, make thinking visible, help students learn from others, and encourage self-monitoring. The systemic character of science learning calls for new methods, called design studies, to support research in science education.

For the mutual benefit

Albert Zeyer, ... Alla Keselman, in Meeting Health Information Needs Outside Of Healthcare, 2015

11.3.2 Structuring student opportunities for critical meaning construction

For fostering health literacy in science education, the use of interdisciplinary contexts is not enough. Moreover, as seen in the HPV-related studies presented in this chapter, health information transmission via lectures and brochures is insufficient. Therefore, in addition to introducing health-related contexts into science education, educational approaches are needed that emphasize critical thinking and support knowledge integration. If one is to take the presented framework model seriously, then students must be given opportunities to build their own individual situational construction of health issues and to then elaborate on their personal judgments. In this context, we point out two approaches that have become key themes in contemporary science education research. One is inquiry-based science education (IBSE) (Osborne & Dillon, 2008), and the other has become known as cultural border crossing (CBC) (Aikenhead & Jegede, 1999).

IBSE is an approach to science education characterized by four aspects (European Seventh Framework Programme, 2007):

IBSE is based on authentic, problem-based teaching and learning activities that are not primarily focused on producing the correct results.

IBSE uses a certain amount of hands-on science. In this context, hands-on science does not only include science experiments, but also acquiring information in libraries, searching the Internet, and interviewing experts.

IBSE contains elements of autonomous, self-organized learning.

IBSE promotes reasoning and communication with peers in groups and in the classroom, which is also referred to as “talking science” (Lemke, 1990).