To make it clear, a CBC approach does not mean complete abandonment of teaching of algorithmic knowledge about vaccination—transmissive or otherwise. Instead, the strategy is complement teaching algorithmic knowledge by helping students to explicitly deal with cultural influences on their situational construction. The IBSE methods can be useful for doing so. Talking science, for example, may enable students to reflect on their skepticism toward scientific medicine. Self-organized learning provides the opportunity to search documents in the literature and in the media and to find out if these documents confirm or reject their personal assumptions about the culture of scientific medicine. The results of these investigations may be presented in talking science events.

In the CBC context, teachers and health professionals take a different role than they usually do in the learning–teaching process. As “culture brokers” (Aikenhead, 2000), they aim not to directly transmit scientific knowledge into students’ heads, but to advise, guide, and encourage students as they are crossing the borders into scientific medical culture. The goal of CBC is autonomous acculturation. This principle leaves it up to each student what insights and techniques they want to “take home” from the visited medical culture, and how they prefer to connect these findings with their own everyday culture. For example, in the vaccination case, it may well be that a student, in spite of their substantial learning of biomedical knowledge, decides to adhere to alternative concepts of health and nature. Nevertheless, they may reevaluate their position on vaccination, or at least on some of the vaccinations they get to know during their learning process. In terms of CBC, such a “hybrid” world conception—stick to alternative health concepts, while accepting one or more vaccinations—would not be seen as a failure of the teaching process, but indeed as a success (Roth, 2008).

The Rise of STEM Education

Thomas Roberts, Audrey Conway Roberts, in International Encyclopedia of Education(Fourth Edition), 2023

Introduction

Science, technology, engineering, and mathematics (STEM) education has increased in popularity (Moore et al., 2020; Ehlert and Roberts, 2021) around the world. Research and policy positions focused on increasing access to STEM education exist in many countries including the United States (e.g., Mohr-Schroeder et al., 2014; National Research Council, 2014), the United Kingdom (Laconte, 2020), Ethiopia (e.g., Melak and Singh, 2021), South Korea (e.g., Kang, 2019; Korean Ministry of Education Science and Technology, 2011), Australia (e.g., Office of the Chief Scientist, 2014), Indonesia (e.g., Arivina and Jailani, 2020), and Pakistan (e.g., Ramzan et al., 2021). STEM education has been positioned as a solution for societal and economic needs. For example, some argue STEM education is necessary for people to function in a rapidly changing world increasingly driven by science, technology, engineering, and/or mathematics (International Technology and Engineering Educators Association [ITEEA], 2020; Mohr-Schroeder et al., 2020). Others argue that STEM education should be emphasized to meet national security and workforce needs (National Science Board, 2015; Maiorca et al., 2021). General fears about falling behind on international test scores also drive an emphasis on STEM education (Fleischman et al., 2010). These competing rationales for STEM education preview the diverse perceptions found in the current literature.