Chapter 9
Chain Reaction:
The Jordanian context

Anwar Batikhi
Jordan Society for Scientific Research, Jordan

Zeid Al-Bashaireh
Mutah University, Jordan

Oraib Nawash
Jordan Society for Scientific Research, Jordan

ABSTRACT

Due to the huge development in the communication sector, science education has become very challenging. Inquiry-based science education (IBSE) has been proposed by academic leaders and policymakers as having the potential to increase student involvement and provide opportunities for the development of the key skills desired by employers in the future. Thirty teachers from 15 schools participated in the project and disseminated the knowledge obtained to their colleagues through peer-to-peer knowledge sharing. Most teachers expressed an increase in their understanding of IBSE, and 66% agreed that they received high-quality IBSE/EUPRB briefings. Students showed motivation to learn science and obtained scientific approaches and steps of answering their inquiries in order understand their surroundings, improve their achievement of scientific knowledge, build positive science attitudes, improve their understanding of the nature of science, and develop IBSE skills such as scientific data collection analyses, interpretation, and how to provide evidence to test ideas and develop theories.

INTRODUCTION

Recently, due to the huge development in the communication sector and the emergence of smart technologies, science education and its approaches have become very challenging, very demanding and boring to some extent to students. This could be seen in students' lack motivation and low self confidence in learning, persistent achievement gaps in science and mathematics among many student subgroups demographic changes, large class size, broken links with other lessons, poor physical conditions of schools

DOI: 10.4018/978-1-5225-5439-4.ch009

Copyright © 2019, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

(fewer laboratory opportunities), and the intensive curriculum allowing insufficient time allocation for science education. Thus, Inquiry-Based Science Education (IBSE) has been proposed by academic leaders and policy makers as having the potential to increase student involvement and provide opportunities for the development of the key skills desired by employers in the future. Thirty teachers from 15 schools participated in the project and disseminated the knowledge obtained to their colleagues (approximately 1440) through peer-to-peer knowledge sharing. Most teachers expressed an increase in their understanding of IBSE and 66% agreed that they received very high quality IBSE/EUPRB briefings. Students showed motivation to learn science as they obtained scientific approaches and steps of answering their inquiries in order understand their surroundings, improve their achievement of scientific knowledge, build positive science attitudes, improve their understanding of the nature of science and developed IBSE skills such as scientific data collection and analyses, interpretation, using creative thought, provides evidence to test ideas and develop theories.

In conclusion, The Jordanian participation in the Chain Reaction Project (CRP) was a priceless opportunity to spread the IBSE approach amongst schools in Jordan.

This chapter describes the Jordanian preparation and the procedures of applying Chain Reaction Project teaching and learning materials. It also presents the barriers that face the implementation or the projects' materials and how they are overcome. Moreover, the chapter sheds light on the advantages and the experiences that Jordanian science teachers, science educators, school head teachers and students gained by taking part at this project.

BACKGROUND

This section will highlight the importance of inquiry-based science education (IBSE) in the expansion of student' knowledge and understanding of scientific concepts or phenomena, and their ability to provide learners with scientific justifications and explanations. Moreover, this section discusses the situation of IBSE in Jordanian education system and Jordan's engagement and participation in the project from its early stages.

It can be claimed that teaching science in an interesting, practical and convincing approach for students is an indispensable tool to cope with the rapid development in science and information technology. Supporting that, several research studies, such as: OECD (2006) and Rocard et al.(2007), reported that as students get older, there is a decreasing interest in studying science and that the unsuitable outdated methods of teaching and learning science in schools are in part to be blamed for this Additionally, another study showed that approximately 60% of European students of secondary level stated that science learning is not interesting enough (Ministry of Education, Youth and Sports CR, 2010). Thus, the Inquiry-Based Science Education (IBSE) approach has been proposed by academic leaders and policy makers as having a great potential to increase student involvement and provide opportunities for the development of the key skills desired by employers in the future (Fensham, 1986; Linn, et al., 2006; European Commission (EC) and High-Level Group on Science Education, 2007). The term 'inquiry' indicates generally the process of acquiring or obtaining information by investigation, often personally and voluntarily carried out by the person who is very keen to find the answer to the phenomenon in question. This approach includes investigation of a problem; finding truth or knowledge that requires critical thinking, making observa-

11 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/chain-reaction/226326

Related Content

Harnessing the Digital Science Education Revolution: Smartphone Sensors as Teaching Tools
Rebecca E. Vieyra, Colleen Megowan-Romanowicz, Daniel J. O'Brien, Chrystian Vieyraand Mina C. Johnson-Glenberg (2023). *Theoretical and Practical Teaching Strategies for K-12 Science Education in the Digital Age (pp. 131-152).*
www.irma-international.org/chapter/harnessing-the-digital-science-education-revolution/317351

NSF-Funded Exploratory Study: Lessons Learned
Eleanor Armour-Thomas (2024). *Using STEM-Focused Teacher Preparation Programs to Reimagine Elementary Education (pp. 231-250).*
www.irma-international.org/chapter/nsf-funded-exploratory-study/338416

Increasing Women's Chances in STEM Fields and Combating Challenges
Karleah Harris, Kieu Ngoc Le, Roseline Jindori Yunusa Vakkiaand Afua Nyarkoa Ofori (2023). *Advancing STEM Education and Innovation in a Time of Distance Learning (pp. 117-138).*
www.irma-international.org/chapter/increasing-womens-chances-in-stem-fields-and-combating-challenges/313729

Introducing iPads into Primary Mathematics Classrooms: Teachers' Experiences and Pedagogies
Catherine Attard (2015). *Integrating Touch-Enabled and Mobile Devices into Contemporary Mathematics Education (pp. 193-213).*
www.irma-international.org/chapter/introducing-ipads-into-primary-mathematics-classrooms/133322

Strategy Instruction and Maintenance of Basic Multiplication Facts through Digital Game Play
André R. Denham (2015). *STEM Education: Concepts, Methodologies, Tools, and Applications (pp. 290-309).*
www.irma-international.org/chapter/strategy-instruction-and-maintenance-of-basic-multiplication-facts-through-digital-game-play/121845