Chapter 11
The Role of Technology in Interdisciplinary Language Teaching:
Bridging Language and Science Learning

Azlin Zaiti Zainal
https://orcid.org/0000-0002-0149-9742
University of Malaya, Malaysia

ABSTRACT

In discourses of 21st century learning, there is an increasing emphasis on interdisciplinary learning. In this chapter, the author first looks at previous research on interdisciplinary teaching and learning. Next, the concept of scientific literacy and how this is related to language will be discussed. The intersections between the teaching of science literacy and language teaching and learning will also be explored. This is followed by research on the use of technology in science education and how technology can enhance science literacy.

INTRODUCTION

Language plays a fundamental role in the in the learning of core content. It has been argued that the ability to participate in a global society will depend highly on learners' key literacy skills such as reading, writing and oral communication (Kracjik and Sutherland, 2010). In the context of science learning, literacy skills are needed to understand science. Not only students will need to learn key concepts to be able to understand a scientific phenomenon but also need to be able to describe and explain

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the phenomenon. Accurate language is especially important in communicating an unobservable phenomenon in order to avoid possible misconceptions. In addition, students need to develop argumentative abilities in justifying a claim. Effective argumentation will depend highly on their ability to reason and communicate their understanding of scientific explanations using appropriate scientific terms and provide relevant evidence.

It is critical to examine the intersection between the two educational fields of language and science and the role of technology in facilitating teaching and learning considering the range of literacy practices involved in acquiring science knowledge. This chapter attempts to explore the potential of technology in enhancing the teaching and learning of science and language as an effort to advance the current understanding of interdisciplinary language teaching and learning in an increasingly globalized world. Yore and Treagust (2006) emphasized the critical role of science literacy in science education in order to help learners develop a better understanding of the specific discourse of scientific writing and enhance their critical thinking skills. Others such as Liu, Chiu, Lin and Barrett (2014) argue for the need for non-native speakers of English studying science to be instructed in both English and Scientific Language Instruction (SLI) considering that "scientific writing patterns and critical thinking skills are needed in addition to strong language abilities" (p.828). In countries where English is not the first language but serves as a medium of instruction in universities, the issue of teaching science in English is even more pressing. The challenges of learning a complex subject such as science in a language different from learners' native language, require an examination of how their learning can be supported with the relevant technological tools.

In view of the importance of complementing science education with language, this chapter will look at the role of technology in science teaching and learning and how the achievement of science literacy is contingent on the literacy practices implemented in the science classroom. It is grounded in the recognition that innovation in education is not only about the application of technology in teaching and learning, but also on capitalizing the advantages of interdisciplinary approach to help learners achieve learning outcomes. The current body of research on the use of technology in science teaching and learning appears to focus predominantly on the effectiveness of technology in achieving science content learning outcomes and do not necessarily address the issue of interdisciplinary learning of language and science. Apart from Liu et al., (2014) there has been limited attempt to synthesize research findings on the role of technology in the interdisciplinary teaching of language and science.

Technology has the potential to enhance science curriculum and equip students with the relevant scientific knowledge and skills not only for school level assessment but also to prepare them for the challenges of workplace. Nevertheless, this also prompts some questions about the role of language in science classroom: What are