

Institutionen för pedagogik, kommunikation och lärande

Digital technologies as support for
learning about the marine environment
Steps toward ocean literacy

av

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AKADEMISK AVHANDLING

som med tillstånd av utbildningsvetenskapliga fakulteten vid
Göteborgs universitet för vinnande av doktorsexamen i
pedagogik framläggs till offentlig granskning

Fredagen den 26 januari 2018, kl. 13:00, Pedagogen, Göteborgs
universitet, hus B, lokal: BE 036.

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UNIVERSITY OF GOTHENBURG
ACTA UNIVERSITATIS GOTHOBURGENSIS

Abstract

Title: Digital technologies as support for learning about the marine environment: Steps toward ocean literacy
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Language: English with a Swedish and a French summary
ISBN: 978-91-7346-939-5 (print)
ISBN: 978-91-7346-940-1 (pdf)
ISSN: 0436-1121
Keywords: Digital technologies, Social media, Ocean literacy, Communication, Science education, Environmental education, Sociocultural theory

Over the last century the ocean has been negatively impacted by human activities. In order to continue benefitting from marine services and goods, and the qualities afforded to human life through the ocean, citizens need to be informed about their relationship to the ocean and their own impact on it, that is they need to be ocean literate. Marine education is challenging, as most of the ocean is invisible to the human eye and marine processes are spread over large temporal and spatial scales. Digital technologies have the potential to support learning about the ocean, as, virtually, they can take the learners into the depth of the ocean and help them visualise complex interactions between different factors over time and space. This thesis consists of four studies scrutinising the role of different digital technologies for learning about marine environmental issues with an emphasis on communicative aspects, with two of the studies having a specific focus on ocean literacy. Study I is a literature review of the use of digital technologies in environmental education. Study II investigates the use of a marine research institute's Facebook page aimed at supporting communication and learning about marine topics. Study III addresses the use of a carbon footprint calculator as an opportunity for students to reason about their greenhouse gas emissions. Finally, Study IV analyses the questions asked by students on an online platform where they engage in an asynchronous discussion with a scientist around the issues of ocean acidification. The four studies show how the use of digital technologies in environmental education can make the invisible visible, allowing engagement with and manipulation of the abstract features of the ocean. These technologies provide a field of action where users can experiment, make mistakes, get feedback and try again in ways that are different from paper-based learning activities. The findings from Studies II, III and IV also illustrate the challenges associated with the technologies, and it becomes obvious that the technical features of a tool do not determine the kind of interactions that will evolve from its use. The contexts in which a tool is used, and what the features mean to the users in situ, are key, and demonstrate the importance of studying not only the outcome of a learning practice but also the ongoing interaction between the users and the tool in a specific context. In conclusion, this thesis offers an overview of the range of impacts that digital technologies can have on the development of ocean literacy, as well as illustrating how technologies open up new ways of learning about marine environmental issues both inside and outside of school. It also provides an account of why ocean literacy is such an important skill for 21st-century citizens living in a rapidly changing world with significant challenges to the environment and our own habitats.