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Virtual fieldtrips and climate change education for tourism students

Christian Schott

School of Management, Victoria University of Wellington, P.O. Box 600, Wellington, New Zealand

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ABSTRACT

While the pedagogical benefits of fieldtrips have long been recognised our ever increasing understanding of the impacts of flying on climate change is presenting educators with a dilemma; the benefits long associated with international fieldtrips are at odds with the world community's needs in limiting/halting climatic change. In response, the paper presents the concept of a Virtual Reality-based virtual fieldtrip as a carbon-sensitive alternative. The paper makes the case for virtual fieldtrips as a meaningful tool for experiential learning and explores both its impact on Greenhouse Gas emissions and climate change-related learning. Not surprisingly, the difference in Greenhouse Gas emissions between a real and virtual fieldtrip is significant while at the same time there is substantial evidence of climate change related learning. More research is required to develop a deeper understanding of the full breadth of benefits, as well as weaknesses presented by virtual fieldtrips.

1. Introduction

Experiential learning has been a strong component of tourism and hospitality disciplines for many decades. Prominent examples are work placements, teaching restaurants/kitchens, and fieldtrips. They are regarded as valuable opportunities for students to bridge theory and practice by learning in and from the 'real world'; both domestically and internationally. However, over the last decade research about the impacts of travel on the climate system has increased rapidly and highlighted a wide range of predominantly negative impacts that are occurring and expected to worsen if the world maintains or even increases its use of fossil-fuel powered transport (Amelung, Nicholls, & Viner, 2007; Becken & Hay, 2007; Schott, 2010; Scott, Hall, & Gössling, 2012). As such, we face a very real dilemma in that the many benefits long associated with international fieldtrips are at odds with the world community's current as well as future needs in limiting/halting climatic change. While all parts of the world will be impacted by climate change, tropical regions will face particularly severe challenges (FAO, 2015). A case in point are popular tropical island tourist destinations such as Fiji, which is the setting for the virtual fieldtrip presented in this paper. Fiji and other small developing islands in the tropics are vulnerable to climate change because of their low adaptive capacity to deal with the negative impacts (Schott, Reisinger, & Milfont, 2010), which is coupled with a high economic dependency on tourism (Nowak & Sahli, 2016) that is expected to be heavily impacted by travel patterns changing away from the equator (Amelung et al., 2007).

In the face of the impacts of air travel in particular, innovative approaches are needed to allow students to learn from other countries and cultures without contributing to climate change. It is worth noting that the fieldtrip tradition is also being challenged by organisational dynamics including financial constraints (Stainfield, Fisher, Ford, & Solem, 2000), concerns about liability issues (Pearson & Beckham, 2005), and staff work-load pressures (Dredge & Schott, 2013).

Against this background, the paper proposes a rethink of the fieldtrip tradition and highlights a new approach that offers

E-mail address: christian.schott@vuw.ac.nz.

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considerable potential to reduce tourism-related Greenhouse Gas (GHG) emissions while at the same time fostering students' learning about climate change. The technological innovation at the heart of this new opportunity is virtual reality (VR) which originates from computer and gaming design. VR is experienced by the user in the form of a virtual world which consists of a three dimensional space which includes representations of people and tools for communication between them (Dickey, 2005). The paper discusses the opportunities offered by VR for the development of a 'virtual fieldtrip' as a valuable, carbon-sensitive way of learning about places, peoples and climate change; it is guided by four sequential aims:

- Present the concept of a VR-based virtual fieldtrip as an experiential learning tool for Sustainable Tourism Management Education (incorporating climate change education).
- Highlight a range of educational benefits offered by a VR-based virtual fieldtrip.
- Examine the GHG emissions–related benefits of a virtual fieldtrip for a class of students compared with a real fieldtrip.
- Explore evidence of climate change-related learning as part of the virtual fieldtrip.

After a review of the literature dealing with experiential learning, digital immersion in education, and climate change education a virtual fieldtrip project for undergraduate Tourism Management students will be introduced. Subsequently, the differences in GHG emissions between a virtual and a real fieldtrip will be examined before an initial exploration of impacts on learning is presented by examining reflective student essays for evidence of climate change-related learning.

2. Literature review

2.1. Experiential learning and fieldtrips

Experiential learning is a theory based on the work of influential 20th century thinkers including John Dewey, Kurt Lewin, Jean Piaget, William James, Carl Jung, Paulo Freire, Carl Rogers and others (Kolb & Kolb, 2005). The theory defines learning as "the process whereby knowledge is created through the transformation of experience" (Kolb, 1984: 41) and consists of six principles: (1) learning is a process, (2) a process that draws out beliefs and ideas about a topic, (3) conflict, differences, and disagreement are what drive the learning process, (4) learning is a holistic process involving the total person, (5) learning results from synergetic transactions between the person and the environment, and (6) learning is the process of creating knowledge.

Educational philosopher John Dewey has long promoted fieldtrips as a powerful type of experiential learning that solidly embraces the six principles. Dewey posits that "nothing takes root in mind when there is no balance between doing and receiving. Some decisive action is needed in order to establish contact with the realities of the world and in order that impressions may be so related that their value is tested and organised" (Dewey, 1934: 45). Research on experiential learning highlights effective bridging of theory and practice at a depth not gained through books and lectures alone (Wright, 2000) and active engagement of students in both testing and generating theories (Scarce, 1997). Importantly, experiential learning suits a variety of learning preferences and draws on active learning which has been credited with engaging students with the subject (Hanson & Moser, 2003; Schott & Sutherland, 2009), enhancing student's knowledge of the subject (Chickering & Gamson, 1987), as well as assisting to develop lifelong learners (Grabinger & Dunlap, 1995). Fieldtrips also place students in a meaningful physical and socio-cultural context (situated learning), which has been credited with crystallising learning outcomes (Jakubowski, 2003). Hence, the merit of fieldtrips, in particular to environments that are culturally, ecologically and/or socially unfamiliar to students is well established.

Although fieldtrips serve to examine a wide range of topics, it is not uncommon for the focus to be related to conservation or sustainability. Herein lies a poignant dilemma. To allow for the above outlined rich learning to take place, staff and students commonly use fossil fuel-powered transport to reach the site/s of the fieldtrip; thus contributing to the issue under study through the emission of GHG. While some may argue that offsetting the fieldtrip's emissions is a viable option for decreasing its contribution to climate change, this appears to happen only rarely. Anecdotally, the reasons are financial constraints as well as doubts about the integrity and/or net benefit of main-stream offsetting programmes. Innovative solutions are needed in the face of climate change (Urry, 2011) and the paper proposes that the 'virtual fieldtrip' concept makes a contribution towards resolving this dilemma. It allows students to conduct fieldwork in a meaningful, virtually represented three dimensional space thus providing students the opportunity to richly and meaningfully learn about the direct and indirect impacts of climate change while minimising related GHG emissions.

2.2. Digital immersion in education

Educators spanning many disciplines have been inspired to recreate aspects of a real fieldtrip by exploring different scenarios of situating students in the material under study and blending it with elements of active learning. Some authors refer to these educational projects as 'virtual fieldtrips'; however the term is used loosely and refers to a wide variety of learning tools ranging from multimedia maps (Krygier, 1999), Internet sites (Cooper, 1997; Crampton, 1999), tele-conferencing coupled with Internet sites (Box-Steffensmeier, Grant, Meinke, & Tomlinson, 2000), a combination of videos, pictures and interpretative text (Turney, Robinson, Lee, & Soutar, 2009), to earlier versions of VR integrated with multimedia (Stainfield et al., 2000). Just over a decade ago VR reached a technological level where other media were no longer needed to create a sense of immersion in the virtual environment, as exemplified by the release of Second Life in 2003. Education applications of Second Life in tourism include virtual fieldtrips to hotels (Deale, 2013; Penfold, 2009) and the creation of a virtual campus (Penfold, 2009), while applications in other disciplines include office hours in virtual offices and education-related conferences in Second Life (Baker, Wentz, & Woods, 2009). Arguably the widest