

Mobile Technology Impact In Support Note-Taking And Sharing Activities During Biology Field Trips

**From the Heidelberg University of Education
to obtain the degree of Doctor of Philosophy (Dr. phil.)**

Approved dissertation by

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15.05.1982

2023

This study was submitted as a PhD dissertation to the
University of Education Heidelberg in July 2023.

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Oral examination date: 06.02.2024

Abstract

Having knowledge of how to apply technology in learning effectively plays an important role in teacher professional development and this kind of knowledge is related to the three teaching-specific knowledge domains, that is the integration among content knowledge, pedagogical knowledge and technological knowledge, as it is called Technological Pedagogical and Content Knowledge (TPACK) (Kajonmanee et al., 2020). This research study aims to explore methods for incorporating mobile technology into biology field trips to support note-taking and sharing activities.

There is a gap in the research literature as most of the studies concerning design guidelines for field study have focused on how to improve the learning experience in the field trip rather than studying how to enhance the use of mobile technology in the field, e.g., Yeh et al. (2006), Kukulska-Hulme, (2007), Rost and Holmquist (2008) and Ryokai et al. (2011) and Kärki, et al. (2018). Also, most studies focused on the school level and less focused on the undergraduate level. Therefore, this research aims to fill the gap by studying the impact of the quality of using mobile technology on capturing and sharing experiences in the field for biology students at the university level.

It presents the result of this qualitative study is to determine what methods and tools students use to capture and share their notes on the field. Therefore, develop a useful guideline for the development of mobile technologies useful to support note-taking and sharing activities.

The study design consisted of two research phases and two case studies from two Universities in Germany:

Phase 1: Observation of 14 undergraduate Biology students attending the Marin ecology field study trip at the Technical University of Kaiserslautern, and 14 undergraduate biology students and teacher students also took part in the Botany Biodiversity field trip at Saarland University.

Phase 2: Interview with 13 undergraduate students who took part in the Marin ecology field trip and 14 undergraduate students who took part in the Botany biodiversity field trip.

The results of this research provided an understanding of generic by identification of the undergraduate biology students' needs and requirements during field trip learning activities, i.e., it was observed that all groups of students take a number of devices with them, these include a mixture of traditional and modern tools such as note and sketchbooks for note taking. Also, it was identified what makes mobile technology good to use in the field, i.e., the system must provide a GPS link function to link the taken notes with a location automatically.

Students generally showed a positive attitude in using mobile devices in the biology field experience as a learning tool, especially in capturing multimedia data such as photos and videos. However, there were some difficulties during the use of mobile devices for students in the context in a practical and efficient way, e.g. due to the nature of the surroundings like the weather condition or geographic environment.

This study aims to develop an overall understanding of the undergraduate students' needs and requirements in their fieldwork experience, leading to the establishment of design guidelines for adapting mobile technology to assist students in capturing and sharing their experiences

on field trips. Consequently, mobile technology design and educational contributions are two significant contributions to this study.

Keywords: Mobile Technology; Experience; Field Trip; Note Taking; Biology

Conference papers accepted from this study:

- Becker, T., Jäkel, L., (2023) "Mobile technology impact in support note-taking and sharing activities during educational biology field trips". EDULEARN23, Palma: Spain

ACKNOWLEDGEMENTS

To my mother Maria Zgouridou, and father, Dr. Saber Abdelhafiz, I am yours both, not only this work ..

To my both sisters Laila and Suzana, my brother Ambntel chafiz, who always supported my back.

To my husband Denis Becker and my little Son Ruslan Becker, who lighten up my life.

My dearest friends, Petra Zang and Mona Dafer, who supported me in my darkest moments during my journey.

Very special thanks and appreciation to my supervisor Prof. Dr. Lissy Jäkel, who showed the biggest support in real times.

I would like to express my thanks as well to Professor Manuela Welzel-Breuer, for her feedback and review to my dissertation.

Thanks to many professors who I met at the conferences, who showed interest in my research work and supported me with their valuable tips.

I would like to mention the support of the STIBET scholarship in the start and in the end of my doctoral studies, therefore another last thanks to the Coordinator of this scholarship as well as the coordinator of all international programs Mrs. Henrike Schön.