Field notebooks are an instrumental tool for geologists. However, they pose challenges for students with physical disabilities, mainly related to limited fine motor skills or because of the need for assistive mobility devices to navigate field sites. Students with diverse physical abilities cannot always effectively handle the pencil and paper approach to typical field notebooks. A GEOPATH project led by a team of researchers associated with the International Association for Geoscience Diversity and funded by the National Science Foundation brought together a cohort of undergraduates with and without physical disabilities examined the use of iPads and other mobile technologies to record field observations on projects ranging from stratigraphy to field mapping. These trials occurred in northern Arizona in 2016 and western Ireland in 2017. Throughout each of the projects, several advantages and disadvantages of electronic field notes were observed, ranging from functionality to cost. The benefits included rain resistant notes that were stored and shared in the cloud, the ability to annotate images to immediately add to notes, carrying fewer tools due to available apps, and GPS services to accurately determine exact output locations. Several disadvantages were also noted, such as the cost of the iPad and apps, battery life, sun glare, and the technological competency of users new to utilizing mobile devices. Despite these disadvantages, this novel approach to a classic field task successfully improved student engagement, allowing them to equally participate alongside their peers.

Methods

The study monitored the development of a two-year GEOPATH project in 2016 and 2017 led by a team of researchers associated with the International Association for Geoscience Diversity and funded by the National Science Foundation, brought together a cohort of undergraduates with and without physical disabilities to compare classical field notebooks to modern digital devices to navigate the difficult terrain of many field locations. During the two years of the project, students worked together to understand geological structures and complete various projects. Throughout these experiences students worked in groups composed of students with and without physical disabilities to encourage students to work together to understand geological structures and complete various exercises. A stratlogger, an application used to create stratigraphic columns, was used to describe the stratigraphy of the Grand Canyon while traversing the Trail of Time. FieldMove, a digital field mapping tool, was used in the Connemara Recess region of Ireland to collect geologic information (i.e. strikes and dips), and to construct a digital field map. Several note taking applications were also used – specifically Evernote and Google docs, and Apple iPad Note app – to assist students with data collection in the field.

Digital Vs. Classical Field Notebooks

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Discussion

Inclusivity of those managing physical barriers and disabilities should be taken into account by those without physical disabilities. Technology can help to promote inclusivity by providing a diversity of methods to incorporate various needs and accommodations. Digital field notebooks are a great first step down the path of inclusion because it provides the basic tools one needs to combine their notes and collaborate with others to meet learning goals. Evernote for recording notes throughout the project. StratLogger and FieldMove were believed to be the most useful during the project for specific exercises, while Google Docs was more preference than Evernote for recording notes throughout the project.