

# THE USE OF MOBILE DEVICES TO IMPROVE THE PRACTICE OF SCIENTIFIC THINKING AND THE SCIENTIFIC PROCESS

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Much of what students learn in science is invisible, which means that theoretical scientific concepts underlying student understanding are often difficult to explain. Additionally, the data required to visualise these theoretical concepts are often difficult to collect as it requires specialised equipment and is time consuming. It is thus difficult to provide students with the hands-on experiences they require to master these concepts; this is a more fundamental problem in online-only courses. To solve this problem, I've created a library of mobile applications that engage students in scientific thinking while encouraging peer-to-peer social interactions. As they interact, these applications collect scientific data that allows students to quickly and accurately visualise the concepts they are learning. In this manner, students gain hand-on experiences through immersive situational learning, and gain novel insights into more difficult to understand theoretical concepts as they perform the behaviours associated with the data gathering. In other words, the library of mobile apps allows students to rapidly and accurately practice being scientists, allowing students to learn through lived experiences. Because the learning opportunities are digital, it means students in face-to-face and online learning environments have similar opportunities. I will discuss the outcomes of trials using these apps.

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