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People, Partnerships and Pedagogies

Multimodal teaching via gamified practical activities – The Virtual Scientist software: Bridging the gap in science education

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In the realm of science education, the utilization of technology has emerged as a powerful tool to enhance student engagement and learning outcomes. This abstract introduces "The Virtual Scientist," an interactive website developed by our team, which enables students to conduct virtual experiments in a 360-degree virtual laboratory. The software employs gamified practical activities and interactive videos to provide students with a realistic laboratory experience, even in remote learning situations. The primary aim of The Virtual Scientist is to bridge the gap between theoretical knowledge and practical application, catering to high school and university students. Additionally, the software is being expanded to accommodate preschool and primary school students, offering age-appropriate virtual experiments. Notably, this innovative platform has gained recognition on a global scale, being adopted by educators worldwide. (Tauber *et al*, 2022)

Recognizing the limitations faced by schools in remote and regional areas lacking laboratory facilities, the team behind The Virtual Scientist embarked on a project to develop laboratory experiments aligned with the Queensland syllabus for senior science. The objective is to provide regional and disadvantaged students with access to these resources, allowing them to complete their mandatory experiments through the website (Levonis *et al*, 2020). By eliminating geographical constraints, this project aims to provide equal opportunities for all students, regardless of their location. Looking ahead, the team envisions expanding The Virtual Scientist to cater to a broader range of scientific disciplines.

The Virtual Scientist represents an Innovative and transformative approach to science education. By leveraging gamified practical activities and interactive videos (Deterding *et al*, 2011), this virtual laboratory overcomes the limitations of traditional classrooms, particularly for students in remote or disadvantaged areas. The success and recognition of this platform attest to its potential to revolutionize science education globally, empowering students to engage in practical experimentation and fostering a passion for scientific inquiry.

The innovative work behind "The Virtual Scientist" has received notable recognition. The authors have been honored with the prestigious AAUT National Teaching Citation Award Citation for Outstanding Contributions to Student Learning and the RSC Horizon Education international award. These awards underscore the exceptional contributions of "The Virtual Scientist" to science education and its impact on student learning.

Keywords: Virtual, Education, Laboratory

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