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'GETTING THE VIBE' IN BIOCHEMISTRY EDUCATION

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Adapting to the recent changing educational landscape has inevitably widened the knowledge gap within an undergraduate biochemistry cohort, presenting challenges to educators to engage with and enhance understanding in biochemistry. Students with a tenuous grasp of basic chemistry (and mathematics) concepts struggle to progress. Visual literacy requires interpreting external representations of molecules into a spatial, 3D conceptual understanding yet competency can be hard to achieve (Linenberger et al, 2015; Hall, 2017; Lohning, 2019).

This study aimed to enhance engagement and understanding by incorporating a series of voluntary workshops harnessing 3D technologies focused on identifying key protein-ligand interactions underpinning drug action. Our 'VIBE' (or 'Virtual reality In Biochemistry Education') sessions included use of Oculus headsets (VR) allowing students to 'step inside a protein', molecular modelling (cheminformatics) and 3D printed proteins. During the session, students completed a workbook prior to being invited to participate in a qualitative feedback survey on their experience, perceived learning and engagement. Qualitative data were analysed thematically while quantitative data comparing students' preferences and perceptions were represented graphically as percentage of participant pool.

80-100% of participants, between 2020-2023, agreed both VR and 3D modelling improved understanding because of the ability to physically explore structure at the molecular level detail while VR lead improved engagement. Thematic analysis supported enhanced engagement with VR and virtual, 3D modelling platforms. 3D printed proteins were less useful due to print quality limitations. Cost and technical considerations for these sessions were not trivial and are limited to small groups. This valuable feedback will help guide deployment of 3D technologies for future cohorts.

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