Investigating the use of technology enhanced assessment to reduce demographic gaps in attainment in physics

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Description:
This project seeks to address demographic gaps in attainment in physics; these mean that not only are certain groups of students, e.g. those of particular gender, socio-economic group or ethnicity or with a disability, considerably less likely to study the subject at higher education level, but also that those who do study have lower levels of retention in completing and passing their studies. This contributes to the “leaky pipeline” whereby the percentage of students and workers in particular demographic groups declines further and further. Various factors have been hypothesised as contributing to these discrepancies in attainment, in particular evidence is emerging that different students respond differently to different assessment tasks and to different features within the tasks (Dawkins et al., 2017).

Particular themes will:

(1) Develop and evaluate a tool that seeks to develop problem-solving skills and to help students to “self-scaffold”, based on earlier unpublished work (see Bolton & Ross, 1997, for context). This is in response to the finding, at two very different universities, that open-ended questions with minimal scaffolding result in particularly large attainment gaps (Gibson et al, 2015; Dawkins et al, 2017).

(2) Further explore the vastly different gender gaps in attainment on different types interactive computer-marked assessment question (Jordan et al., 2017) and extend this work to consider other differences between other demographic groups.

(3) Investigate the affordances of sophisticated computer-marked assessment for students with disabilities (Bell, 2009).

The Open University is global maintainer of the Moodle VLE Quiz Engine and is already the world leader in the development of interactive computer-marked assessment and feedback, with many collaborators across the world in a range of sectors. Two question types, of particular use in assessing and giving feedback in physics are Pattern Match and STACK:

- The Pattern Match question type requires users to type their answer as a free text phrase or sentence (e.g. Butcher & Jordan, 2010).
- The STACK question type is based on a computer-algebra system and has been adapted for the marking of units etc., thus opening opportunities for inclusive assessment in physical sciences (e.g. Sangwin & Harjula, 2017).

References


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Qualifications required:

Applicants must have graduated (or be about to graduate) with an honours degree in Physics or a related discipline. A demonstrable interest in technology-enhanced learning and in qualitative as well as quantitative research methodologies would be an advantage.

Whilst being most suitable for a full-time student at the Open University, this project may also be suitable for a well-qualified applicant who wishes to complete a research degree part-time and at a distance from the OU, provided they are willing and able to make regular visits to the campus.