

A CULTURALLY DIVERSE LEARNERS' CONCEPTUAL PHYSICS PROGRESSION: A COVID TRANSITION IN 2020 AND ONWARDS

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In this presentation we discuss the conceptual progression of a mechanics physics course taught at the Physics Department at the University of Johannesburg (UJ) in 2020 (Carleschi et al, 2022). The number of students enrolled is typically of the order of 400 each year and this has led to challenges in transitions between online learning and face-to-face. The force concept inventory (FCI) has been extended at the Physics Department using a conceptions/'misconceptions' lens for a further two years, to include 2021 and 2022. We present and explore the effects that switching mid-semester from traditional classes to online classes, as imposed by the COVID-19 lockdown in South Africa, has had on the teaching andragogy at UJ.

We discuss the initial stages of how using 'dominant misconceptions', as derived from the pre-test part of the Force Concept Inventory (FCI) assessment tool, can give informative data on how to proceed with teaching practices on a classical mechanics course, as taught in the Physics Department of the University of Johannesburg. We also briefly discuss some details of language effects between high school matriculation marks and FCI scores, and how this may prepare faculty members when considering their teaching andragogy. South Africa is a diaspora of languages with over 10 official languages spoken, besides the multitudes of other dialects.

Specifically, we used a question-by-question comparison of different cohorts of the 30 question FCI and we also looked at correlation coefficients between high school matriculation scores including language spoken at home and performance on the FCI.

REFERENCE

Carleschi, E., Chrysostomou A., Cornell A. S., & Naylor W. (2022). Probing the effect on student conceptual understanding due to a forced mid-semester transition to online teaching. *European Journal of Physics*, 43, 035702. <https://doi.org/10.1088/1361-6404/ac41d9>

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