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Chemical Education Article

An Experiment in Technological Pedagogical Content Knowledge: Effect of Online Video Support on Student Comprehension And Critical Thinking in Chemistry

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ABSTRACT

The goal of this research was to comparatively examine the effect of online support through chemistry videos, created by the author, on the student performance for a group of students and its comparison with those students who did not have the support. The study was carried out on two groups of students belonging to 2 different divisions of First year Bachelor of Science with 135 students in each of them such that one of the division students were provided with video support on YouTube in accordance with the fundamental premise of Technological, Pedagogical and Content Knowledge (TPCK) which takes into account effective technological integration of teaching specific content with pedagogical skills. Chemical Kinetics unit of the Physical Chemistry syllabus was chosen about which the students had some fundamental knowledge from their earlier studies. A knowledge based diagnostic test was administered before starting with the topic and an internal assessment was administered after the completion of the unit for both the groups. The internal assessment was designed on the basis of Bloom's Taxonomy. In the internal assessments both the groups performed better than that in diagnostic tests however the performance of the group with the online video support far exceeded compared to those without the online support in understanding and application oriented questions. This study in Chemistry education, unlike many similar studies, is quantitative in nature rather than based on student perceptions and can be useful to chemistry educators.

Keywords: Chemical Education Research, Technological Pedagogical Content Knowledge, ICT, Educational videos, Bloom's Taxonomy.