



Revision more of the same, or is there greater merit in a different approach?

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Abstract: *In the period prior to examinations students commonly spend hours revising, in an attempt to improve their knowledge and memory of the course work. This is certainly true in physics, hence research on the subject of revision could be deemed relevant and useful. In certain contexts there are two or more quite different approaches by which the material may be taught. The question arises: is it better, in terms of the understanding and retention of concepts, to revise the material using the same way it was initially taught, hoping to increase retention by repetition, or to use a different approach, hoping to improve understanding by parallel reinforcement? In the physics of elementary magneto-dynamics there is a "standard" approach to understanding why a current-carrying coil in a magnetic field experiences torque, in which the force on each side of a square loop is analysed separately. There is also a non-standard approach that considers the current-carrying loop to be a magnetic dipole between two magnetic poles, enabling students to predict whether or not torque is applied on a coil, and if so, the direction it would rotate.*

The teachers of 78 students in five classrooms trialled the non-standard approach. The control had 72 students in five classrooms revising the same syllabus material, their teachers re-using the traditional method. A pre-test was compiled based on a mixture of seven multiple-choice questions, together with free response questions from previous high school public examinations. The efficacy of the revision methods was assessed in four different ways. Initially the pre-test results were mapped against those of an identical post-test, and the improvement analysed. Later one of the free response questions was assessed using a five-level SOLO-style taxonomy.

Qualitative data analysis also demonstrated where several participants were successfully using their revision method. Moreover, students assessed the novelty and perceived effectiveness of the revision method they employed using a self-rating questionnaire.

The results were uniformly promising.