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Termites in our tests? The role of stigmergy in our examination system

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**Abstract content (Max 300 words)
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This study is inspired by perceived shortcomings in the ‘problem-solving’ abilities of undergraduate physics students. A detailed analysis of student performance in examinations in relation to the type of question being answered for a first year physics course for engineering students has been undertaken. The data collected show that firstly, there is empirical evidence in support of these perceptions. Secondly, evidence has also emerged that there is a favoured question-type that can explicitly be taught and relatively easily mastered, and which typically makes up a sufficiently large fraction of an examination that students can pass without having to demonstrate any real problem-solving ability. What students need to demonstrate instead is a well-developed ability to expedite routine operations of various levels of complexity – which by definition does not amount to problem-solving. It is possible that this bias has become established stigmergically via a feedback process sometimes called ‘backwash’ to which candidates, examiners and instructors have all been party. Candidates learn what kind of questions to expect, examiners learn what kind of questions candidates can be expected to answer, and instructors learn what kind of questions need to be taught, by traces left in the system’s environment. The third outcome of the study has been the emergence of a taxonomy of question types typically set in physics examinations.

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