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**Characterizing the Fundamental Intellectual Steps Required in the Solution of Conceptual Problems<sup>1</sup>**

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At some level, the performance of a science class must depend on what is taught, the information content of the materials and assignments of the course. The introductory calculus-based electricity and magnetism class at the University of Arkansas is examined using a catalog of the basic reasoning steps involved in the solution of problems assigned in the class. This catalog was developed by sampling popular physics textbooks for conceptual problems. The solution to each conceptual problem was decomposed into its fundamental reasoning steps. These fundamental steps are, then, used to quantify the distribution of conceptual content within the course. Using this characterization technique, an exceptionally detailed picture of the information flow and structure of the class can be produced. The intellectual structure of published conceptual inventories is compared with the information presented in the class and the dependence of conceptual performance on the details of coverage extracted.

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