November 2008

My colleagues and I in the Department of Applied Mathematics and Statistics have eagerly discussed the proposed Ways of Learning requirements distributed by CEP. We strongly support the idea of a statistical reasoning requirement, and we also support the notion of having separate quantitative and statistical reasoning requirements. Statistical reasoning is a critical skill for all individuals to be able to make intelligent decisions in the presence of uncertainty (which is always present in real life), from tasks such as reading a newspaper to designing and running an experiment. However, we would like to suggest a broader interpretation of "statistical reasoning".

The current wording closely resembles the syllabus of a standard broad-audience introductory statistics course, such as AMS 5, AMS 7, or Psych 2. The list of topics is rather specific, and covering all of these topics would preclude covering other topics that might be more relevant for students in specific disciplines. For example, current courses such as Econ 113 or AMS 132, while being courses in statistical reasoning, cover other aspects of statistical inference, such as modeling and estimation, which may be more important for those students, but thus do not have time to cover some of the items in the currently proposed requirement.

We hope that CEP would consider re-wording the statistical reasoning requirement to focus on the principles, rather than the specific topics. The current list could be given as an example of how one would fulfill the bigger principles, so as long as each of the major concepts is covered, it would not need to be covered in the specific manner that the current proposal requires.

An example of such a re-wording would be:

> Statistical Reasoning/data interpretation
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> These courses incorporate statistical concepts and statistical reasoning into course material. Students acquire an understanding of making informed decisions in the presence of uncertainty; of statistical terms and ways of representing data; and of basic inferential statistical techniques.
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> Courses should
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> a) teach the use of descriptive statistics, e.g., data collection and classification, measures of central tendency and variation, graphic presentation and ways in which data presentation can be used to inform or mislead
>
> b) provide an understanding of variability and uncertainty, e.g., understanding sampling techniques, interval estimates (such as confidence intervals), the relationship of sample size to uncertainty
> c) expose students to topics in inferential statistics, e.g., point estimation, hypothesis testing, statistical significance, modeling of data

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