

On the Utility of E-Learning in Statistics

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Summary

Students of introductory courses consider statistics as particularly difficult, as the understanding of the underlying concepts may require more time and energy than for other disciplines. For decades statisticians have tried to enhance understanding with the help of technical solutions such as animation, video or interactive tools. However, it is not clear if the added value generated by these e-learning tools justifies the work invested. In this paper the experience with various e-learning solutions in terms of utility and the impact on teaching is discussed.

Key words: E-learning; spreadsheets; PISA study; online learning tools.

1 Introduction

Before technical details are discussed it is necessary to clarify the vocabulary. E-learning describes all kinds of learning, where digital media are used for the presentation and transmission of learning materials and/or to support inter-human communication. In general e-learning tools can be grouped into:

- video conferencing and tele-teaching systems;
- simulations with or without user interaction;
- learning (content) management tools;
- content catalogues and podcasting;
- web and computerbased training applications.

In the context of this paper the term e-learning refers mainly to the last category of this list, to web and computerbased training applications.

The projects proposed by Nolan & Temple Lang (2007) and Darius *et al.* (2007) also fall into this category as they offer two different technical solutions to improve the understanding of statistics by students. Nolan & Temple Lang (2007) propose a system for interactive and dynamic documents which allows students to follow the complex decision making processes of a statistical analyst. As an example they take the classification of emails into spam and ham using different dialogues for, e.g. data loading, derivation of classification variables and statistical classification & prediction.

Darius *et al.* (2007) present a set of Java applets to assist student understanding of experimental design. For two common situations in experimental design, the optimization of an industrial