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Applying a theoretical model for explaining the development of technological skills in statistics education.

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Summary: Technology has become an inseparable part of modern statistical practice, and, to a large extent, modern statistics courses. The literature on technology in statistics education has focused heavily on the role of technology for improving students' understanding. However, limited research has examined the development of technological skills for "doing" statistics, e.g. using statistical packages. This paper proposes a distinction between these two roles of technology and how both benefit student learning. The paper then applies *R. Kanfer* and *P. L. Ackerman*'s ["Motivation and cognitive abilities: an integrative/aptitude-treatment interaction approach to skill acquisition", *J. Appl. Psych.* 74, No. 4, 657–690 (1989; doi:10.1037/0021-9010.74.4.657)] integrative model of skill acquisition to explain the variability in students' technological skill development. The ability to use statistical packages, arguably the most pervasive example of statistics technology, is used as an example to illustrate this model. The implications of the model are then discussed in the context of teaching technological skills in statistics courses. Future directions and challenges related to this area of are discussed.

Classification: K15 U75

Keywords: statistics education; information technology; computer as educational medium; statistical software; technological skills; learning outcomes; statistical literacy; statistical reasoning; statistical thinking; two major roles of technology; technology for understanding statistics; technology for doing statistics; statistical package skills; theoretical models; integrative model of skill acquisition; active-exploratory training; error-management training; metacognition
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