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Benefits of adding anxiety-reducing features to a computer-based multimedia lesson on statistics.

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Summary: The present study examined the effectiveness of techniques intended to reduce anxiety as students learn mathematical content from a computer-based lesson. In a between-subjects experiment, students learned statistical rules through worked examples in a computer-based learning environment that either did (treatment group) or did not (control group) include anxiety reducing features – a coping message delivered through the lesson by an online pedagogical agent concerning how to manage feelings of anxiety, and prompts for expressive writing, in which students summarize their thoughts and feelings. An independent samples t -test showed that the treatment group, which received added anxiety-reducing features, showed higher accuracy than the control group on solving practice problems ($d = 0.71$) and retention problems ($d = 0.63$) and reported higher perceived effort on learning the multimedia lesson ($d = 0.66$). In addition, a standard multiple linear regression found that anxiety, self-efficacy, and cognitive load as a set predicted performance ($R^2 = 0.56$), with self-efficacy as the strongest predictor ($\beta = 0.63$). Adding anxiety-reducing features to an online lesson may encourage greater effort, which leads to better learning outcomes.

Classification: U55 K45 K75 K85 C25

Keywords: anxiety; statistics learning; computer-based learning; multimedia instruction

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