THE CHALLENGE OF MAINTAINING ACADEMIC INTEGRITY AND REDUCING STATISTICS ANXIETY - COMPARING BETWEEN THREE LEARNING ENVIRONMENTS

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Keywords

Academic integrity; statistics anxiety; academic dishonesty; planned online learning; emergency remote teaching; face-to-face learning; Covid-19

Abstract

The current research examines the impact of statistics anxiety on academic ethical behavior as manifesting in undergraduate social science students attending introductory statistics courses in different learning environments: Covid-19-Emergency Remote Teaching (ERT), Planned Online Environment (POE), and Face-to-Face (F2F) courses.

The learning environment refers to the "where" and "how" students learn whether physically, digitally, culturally, or contextually. The elements constituting a learning environment are the people in it, the technologies available, its physical layout, its social and cultural environment (Whittle et al., 2020), and the pedagogical methods employed by teachers (Popan, 2020). Learning environments involve social, psychological, and pedagogical features affecting student achievement and attitudes (Helms, 2014). Research studies have established that students' attitudes and anxiety explain performance in statistics courses (Onwuegbuzie, 2003). Previous research comparing students' performance in POE and F2F statistics courses have inconsistent findings (Frey-Clark et al., 2019; Scherrer, 2011).

Statistics anxiety is a common phenomenon of situational anxiety. It is defined as a momentary feeling of anxiety aroused when taking a statistic course or dealing with statistical analysis (Zahan et al., 2020), the effects of which may negatively affect performance. Statistics anxiety is a personal feeling of disturbance, uneasiness, nervousness, and fear connected to statistics (Steinberger et al., 2021). It is determined by situational antecedents and the educational environment (Steinberger, 2020).

Scholarly studies have shown that anxiety and unethical or dishonest behavior (like academic dishonesty) correlate (Kouchaki & Desai, 2015). People experiencing anxiety tend to feel self-threatened and engage in unethical acts to restore confidence (Zhang et al., 2020). More specifically, studies have shown that anxiety feelings are frequent among students and academy members. An example may be students being required to work on complex and difficult educational tasks. They often turn to dishonest behavior (Wenzel & Reinhard, 2020) to avoid situations that they identify as potentially triggering anxiety feelings.

Thus, based on the literature, we constructed a mediation model that evaluated the role of

statistics anxiety as manifesting in social sciences undergraduate students, which accounts for the relationship of previous academic achievements and academic dishonesty. We hypothesized that learning environments and the differences in the mediating role of statistics anxiety in students' learning in POE, F2F, and ERT affect the suggested mediation model.

Data were collected from students in Israeli academic institutions studying for a bachelor's degree in social sciences. There was a total of 291 participants, of whom 12% were male students and 88% were female students. Participants' average age was 22 years. The questionnaires were administered to the participants in three different types of course enrollment: 39% of the students enrolled in POE, 29% in F2F, and 32% in ERT courses, through an online platform after receiving approval from the ethics committee. Over half of the participants (53%) reported that they had committed at least one act of academic misconduct. Structural Equation Modeling (SEM) was used to examine the relationship between students' previous academic achievements and academic dishonesty mediated by statistics anxiety.

The results of the multi-group analysis show that path coefficients differ between the three learning environments (POE, F2F, and ERT). Specifically, the results support a model in which previous math and academic achievements are significantly related to academic dishonesty mediated by statistics anxiety in a POE context only. Accordingly, POE statistics learning is less effective than F2F instruction and practice.

Our research shows that instructors' presence in the learning process reduces students' anxiety levels and unethical behavior. Thus, we recommend that in POE, the instructor's presence includes supportive, emphatic, and interpersonal interaction to reduce virtual distance. We further conclude that introductory courses in statistics need to empower students experiencing statistics anxiety for a better sustainable statistical literacy population and maintaining a high level of academic integrity.

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