Digital Overload and Its Impact on Mathematics Students' Well-Being and Academic Performance

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Abstract:

In today's digital age, students in higher education increasingly experience digital overload, defined by excessive use of digital devices and constant connectivity. This phenomenon can negatively impact mental health and academic performance, leading to stress, anxiety, reduced concentration, and disrupted sleep. Among students of mathematics—a discipline requiring sustained cognitive effort and focus—the risks associated with digital overload are particularly relevant.

This study investigates the effects of digital overload on mental well-being and academic engagement among mathematics students enrolled in STEAM programs at the Universitat Politècnica de València. A mixed-methods approach was employed, using convenience sampling to survey and interview 289 undergraduate students. Quantitative data were analyzed with SPSS, applying descriptive and inferential statistics, including Pearson and Spearman correlations. Qualitative responses were explored through thematic analysis using NVivo.

Findings reveal a strong correlation between high digital engagement and several indicators of psychological distress, including difficulty concentrating, increased irritability, and disrupted sleep patterns. Many students reported feeling pressured to remain constantly connected, even outside of academic settings. This pressure often translated into reduced participation in offline academic tasks and difficulty managing time effectively.

The results highlight the need for targeted institutional strategies to mitigate the impact of digital overload. Promoting digital well-being through awareness campaigns, structured digital breaks, and mental health resources tailored to cognitively demanding disciplines like mathematics is essential. Additionally, integrating discussions about healthy technology use into academic settings could empower students to adopt more mindful and balanced digital habits.

By addressing digital overload as a systemic issue in education, universities can enhance both student performance and psychological well-being, especially in fields where focus and deep thinking are critical. This research underscores the importance of developing a supportive digital culture within higher education.

Keywords:

Digital overload, mathematics students, mental well-being, academic performance, higher education.