

Neuroscience teaching in higher education: efficacy and students' perception of an asynchronous online course

Introduction: Higher education faces the challenge of adapting its methodologies to contemporary demands, with neuroscience emerging as a promising field to optimize learning. Online and asynchronous courses represent a scalable strategy to overcome geographical barriers and democratize access to knowledge. In this context, the development of self-instructional materials that foster student autonomy is essential for disseminating neuroscience content.

Objectives: To develop an online and asynchronous neurocourse for undergraduates and evaluate its effectiveness based on knowledge gain and participants' perceptions.

Methods: A total of 124 students (18–29 years) were randomly assigned to a control ($n = 62$) or experimental group ($n = 62$). Both groups completed pre- and post-questionnaires, including sociodemographic data and a neuroscience knowledge test. The experimental group participated in a six-week asynchronous neurocourse, assessed through pre- and post-module questionnaires and the knowledge test. Additionally, this group completed the Instructional Material Motivation Survey (IMMS-BRV) and the reaction scale to instructional procedures and results. Descriptive and inferential statistical analyses (Student's t -test and 2×2 ANOVA) were conducted using JASP software (v. 0.95.0).

Results: The analysis of the neuroscience questionnaire revealed a significant interaction between time and group ($F(1,122) = 233.23$, $p < 0.001$, $\eta^2 p = 0.66$). The experimental group showed a significant increase from pre- to post-test ($p < 0.001$, $d = 1.72$), outperforming the control group in the post-test ($p < 0.001$, $d = 1.38$). Performance across modules also indicated significant improvement ($t(61) = 4.09$, $p < 0.001$, $d = 0.52$). Student perception was highly positive, with elevated situational motivation (IMMS-BRV Mean = 4.66) and high satisfaction regarding learning procedures and outcomes.

Conclusion: The asynchronous self-instructional method proved effective in significantly increasing neuroscience knowledge and offering a positive learning experience, characterized by high levels of motivation and satisfaction.

Palavras-chave

Neurosciences; Distance learning; Teaching methodology; Higher education.

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Track Classification: Inovações Tecnológicas e Metodológicas para Educação Virtual e Híbrida