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Communication 65

Enhancing critical thinking: Exploring the impact of blended learning on veterinary medicine students

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Introduction

The Think4Jobs Project, available at <https://think4jobs.uowm.gr/>, aimed to introduce blended curricula focusing on critical thinking (CT) into

apprenticeships and courses, and to evaluate the resulting changes in CT skills and dispositions (Rebelo et al., 2023). This initiative targeted the enhancement of critical thinking alongside the core knowledge proposed for the courses. In the academic year 2022/23, three courses underwent pilot testing with CT-blended curricula: Imaging (5th semester), Deontology (7th semester), and Gynecology and Obstetrics (8th semester). No overlap existed between students engaged in these courses.

Design of Activities

The study employed a non-randomized convenience sample. To evaluate changes in CT skills and dispositions, students were asked to complete a questionnaire at the beginning and end of the semester (pre- and post-tests). The questionnaire included the short-form of the Critical Thinking Self-Assessment Scale (CTSAS-SF) for skills and the Student-Educator Negotiated Critical Thinking Dispositions Scale (SENCTDS) for dispositions (Payan-Carreira et al., 2023). The questionnaires demonstrated good internal consistency (Cronbach's alpha of .969 and .842 for CTSAS-SF and SENCTDS, respectively). Paired t-tests were used to compare pre-test and post-test scores and assess changes in CT skills and dispositions.

In the Imaging course (5th semester), students were tasked with analyzing image exams to identify underlying issues and propose solutions. In the Imaging course, students were tasked with analyzing image exams to identify underlying issues and propose solutions. Deontology students analyzed ethical dilemmas, discussed arguments for and against, assessed moral/ethical damage, and suggested penalties for breaches of laws or regulations. Gynecology and Obstetrics students worked on clinical cases, analyzing diagnostic pathways, considering the need for additional exams, and devising therapeutic approaches aligned with animal owners' expectations and animal welfare (for details on the activities see Mäkiö et al., 2022).

Results

Of the 205 students enrolled in the piloting course, 100 (48,8%) filled out the pre-test and post-test questionnaires. 79% of the respondents were female,

and 21% were male. The students' mean age was 22.32 years ($sd=4.62$; range= 19-52). 42% of the respondents were enrolled in Deontology, 36% in Imaging, and 22% in Gynecology and Obstetrics. Means' comparison between sexes in the pre-test evidenced the inexistence of significant differences between male and female students on the CT skills scales except for the skill "Analysis" ($p = 0.035$), with men presenting higher averages than women. Regarding the CT dispositions, significant differences were found in "Organization" ($p = 0.001$), with the women presenting a higher average. Age did not present a significant relationship with any of the CT skills or disposition dimensions.

Overall, the interventions allowed an increase in all the tested dimensions of CT skills (Interpretation, Evaluation, Analysis, Inference, Explanation, and Self-Regulation) and in the integrated CT skills score ($p=0.0001$), as well as in the integrated CT dispositions score ($p=0.010$) and in the scores for the dispositions' dimensions Reflection ($p=0.001$), Perseverance ($p=0.005$) and Intrinsic Goal Motivation ($p=0.0001$). However, no significant changes were recorded in Attentiveness, Organization, and Open-mindedness. Moreover, the analysis of the differential effect of the interventions performed in the three courses showed the inexistence of differential effects for the course over the scores obtained by the students.

Discussion and Conclusion

Even though the students were engaged in the pedagogical interventions established for each course, it was difficult to obtain their compliance towards the questionnaires, and through time students have been extricating themselves from the CT questionnaires. Therefore, the representativeness of students in the pre-test/post-test pairing is slightly below 50% of the students enrolled in the activities. The gains in CT skills were higher than gains obtained in CT dispositions, which may be related to the fact that more time is needed to change attitudes in a person (willingness to act) than a procedure or product (way of reasoning). Nonetheless, the gains obtained suggest a correct alignment of the interventions with the targeted CT outcomes. Surprisingly, no differences were found in the average gains in

students enrolled in the three courses. Even though a general framework was used in the three courses, the complexity of the activities, the strategies, and the form they were implemented differed among the three piloting courses. Such results suggest that the intentionality for intervention (implement the strategies), more than the type of the strategy itself may efficiently enhance the students' CT, supporting a shift towards a constructivist approach to learning.

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