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Fostering the skills of critical thinking and question-posing in a project-based learning environment

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Highlights:

- It is an Educational Effectiveness Research (EER) type, which focuses on evaluating an innovative program's effect on two skills: critical thinking and question-posing.
- This research examined an innovative program for 9th and 10th graders. The program implemented a project-based learning.
- The innovative class was compared to a traditional class at three points in time over two years using pre- and post-case-based questionnaires.
- Students in the innovative learning environment had a significant advantage in these skills after two years.
- The results emphasize the importance and contribution of a case-based evaluation method for "evidence-based education."

Abstract

Innovative pedagogical models for teaching and learning aimed at developing higher order thinking skills require more sophisticated evaluation mechanisms than traditional pedagogical models to determine their effectiveness. In recent years, increased implementation of creative pedagogy has stimulated a parallel interest in the field of educational effectiveness research (EER). EER studies the factors impacting educational outcomes. This research examined an innovative program for 9th and 10th graders. The program implemented a project-based learning, constructivist approach with three teachers co-teaching each lesson to maximize development of high-order thinking skills. Students learned the required ministry of education material for all subjects through projects based on group work and peer learning. The research goal was to evaluate the innovative program's effect on two skills: critical thinking and question-posing. The innovative class was compared to a traditional class learning the same material at three points in time over two years using pre- and post-case-based questionnaires (71 students, total of 192 questionnaires). Although no significant differences were found between the classes in the critical thinking pre-questionnaire, students in the innovative learning environment had a significant advantage in this skill after two years. Significant differences in question-posing were found in the pre-questionnaire and the gaps enlarged over