A novel measurement system for short-term outcomes of the scholarly concentrations program

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Abstract
With the development of medicine education, the scholarly concentrations program has been designed for training physician-scientists. We investigated the evaluation of the short-term outcome of the program using a written examination, submitted proposal and formal presentation. We compared the performance of 87 students on the written examination who selected the program with that of 80 students who did not receive the training. In addition, 39 students participated in the written examination before and after the training, and also took part in the California Critical Thinking Skills Test (CCTST) after the program. The trained students completed the questionnaire and participated in the graduation examination of the school. The data from the written examination showed that trained students were more skillful than untrained students. Compared with the baseline, the student achievement was significantly higher after training; meanwhile, the scores from logical reasoning questions were increased by 2.1-fold. CCTST test scores were positively correlated with the scores from logical reasoning questions in the written examination. There was no correlation between a given student's grade on the submitted project and his/her score on the written examination. The majority of the students thought that the program improved their ability to collect information and solve problems. No correlation between the student's performance of this course and the graduation examination was observed. The program is effective to improve the students' skills in experimental design and may be useful to develop their critical thinking ability. The written examination and formal proposal complement each other in the assessment of short-term outcomes. The scholarly concentrations program can be an important supplement to medical curriculum system.

Distribution of students in different performance ranges (excellent, scoring 86–100; very good, scoring 76–85; good, scoring 60–75; insufficient, failing the examination) in the

Distribution profile of scores on the written examination versus grades on submitted proposals with respect to the students who selected the scholarly concentrations

The performance of the students on the written examination was markedly improved by the training 2017.

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