



THE EFFECTIVENESS OF MENTORSHIP-BASED INTERACTIVE EDUCATIONAL TECHNOLOGIES IN HYGIENE EDUCATION

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Annotation: This study investigates the effectiveness of mentorship-based interactive educational technologies in hygiene education among medical students. A quasi-experimental design involving 100 students was employed, with participants divided into control and experimental groups. The experimental group was taught using mentoring, case studies, problem-based learning, reflective analysis, and group discussions, while the control group received traditional instruction. The findings revealed significant improvements in analytical thinking, academic achievement, and professional competencies among students exposed to mentorship-based learning. The proportion of students demonstrating high analytical thinking increased from 12% to 54%, and notable progress was observed in problem-solving, independent decision-making, teamwork, and scientific information analysis. The results indicate that integrating mentoring approaches with interactive educational technologies enhances the quality of hygiene education and contributes to the professional development of future physicians.

Keywords: hygiene education, mentoring, interactive learning, analytical thinking, medical students, professional competence.

INTRODUCTION

The rapid development of healthcare systems and increasing public health challenges require future physicians to possess not only theoretical knowledge but also analytical thinking, critical reasoning, and evidence-based decision-making skills. Consequently, modern medical education is shifting from teacher-centered instruction toward learner-centered and competency-based approaches.

Hygiene education occupies an important place in medical curricula because it equips students with the knowledge and skills necessary to assess environmental and occupational health risks, evaluate sanitary conditions, and develop preventive measures. However, traditional instructional methods often fail to stimulate independent learning and analytical reasoning among students.

Mentoring has emerged as an effective educational strategy that promotes individualized learning, professional development, and active student engagement. When combined with interactive educational technologies such as case studies, problem-based learning, and reflective analysis, mentoring can create a supportive learning environment that enhances students' cognitive and professional development.





Despite increasing interest in mentoring and interactive learning in medical education, limited research has examined their integrated application in hygiene education. Therefore, this study aims to evaluate the effectiveness of mentorship-based interactive educational technologies in developing analytical thinking and professional competencies among medical students.

Research Aim

To determine the effectiveness of mentorship-based interactive educational technologies in improving analytical thinking and professional competencies among medical students studying hygiene.

Research Hypothesis

The implementation of mentorship-based interactive educational technologies significantly improves students' analytical thinking, academic achievement, and professional competencies compared with traditional teaching methods.

MATERIALS AND METHODS

Study Design

A quasi-experimental pedagogical study was conducted to evaluate the effectiveness of mentorship-based interactive educational technologies.

Participants

The study involved 100 medical students enrolled in hygiene courses. Participants were divided into:

- Control group (n = 50)
- Experimental group (n = 50)

Intervention

Students in the experimental group participated in:

- ✓ Mentoring sessions
- ✓ Case-study activities
- ✓ Problem-based learning
- ✓ Reflective analysis
- ✓ Small-group discussions

The control group received instruction through traditional lectures and practical classes.

Data Collection Methods

The following methods were employed:

- ✓ Literature review and theoretical analysis
- ✓ Pedagogical observation
- ✓ Questionnaire surveys
- ✓ Interviews



- ✓ Case-study assessment
- ✓ Comparative analysis
- ✓ Statistical evaluation
- ✓ Outcome Measures

The study assessed:

- ✓ Analytical thinking levels
- ✓ Academic achievement in hygiene
- ✓ Professional competency development
- ✓ Student perceptions of mentoring activities

Statistical Analysis

Pre- and post-intervention data were compared using percentage-based descriptive statistical methods to determine educational effectiveness.

RESULTS

Analytical Thinking Development

Before the intervention, analytical thinking levels were comparable between groups.

Table 1. Analytical Thinking Levels Before the Experiment

Level	Control (%)	Experimental (%)
High	10	12
Medium	46	44
Low	44	44

After the intervention, substantial improvement was observed in the experimental group.

Table 2. Analytical Thinking Levels After the Experiment

Level	Control (%)	Experimental (%)
High	22	54
Medium	52	38
Low	26	8

The proportion of students with high analytical thinking skills increased by 42 percentage points in the experimental group.

Academic Achievement

Table 3. Academic Performance in Hygiene

Achievement Level	Before (%)	After (%)
Excellent	18	46
Good	34	40
Satisfactory	38	12
Unsatisfactory	10	2

Academic performance improved considerably following the implementation of mentorship-based learning.

Professional Competencies



Table 4. Professional Competency Indicators

Competency	Before (%)	After (%)
Problem Analysis	42	81
Independent Decision-Making	38	76
Teamwork Skills	56	88
Scientific Information Analysis	40	79
Assessment of Hygienic Situations	45	84

Student Attitudes Toward Mentoring

Table 5. Survey Results

Case studies enhanced analytical thinking	88
Group discussions were beneficial	94
Individual mentoring was effective	90
Methods should be used in other subjects	96

The findings demonstrate that mentorship-based interactive educational technologies significantly enhance students' analytical thinking and professional competency development. These results are consistent with previous studies emphasizing the educational benefits of mentoring and learner-centered pedagogies.

The substantial increase in analytical thinking observed in the experimental group suggests that mentor-guided learning environments facilitate deeper cognitive engagement and more effective problem-solving processes. Similarly, improvements in academic achievement indicate that interactive learning methods strengthen the connection between theoretical knowledge and practical application.

The positive student perceptions further support the effectiveness of mentoring approaches. High levels of satisfaction suggest that mentoring promotes motivation, active participation, and professional growth.

Nevertheless, several challenges were identified, including limited methodological preparedness among faculty members, insufficient educational resources, large student groups, and the absence of standardized mentoring assessment criteria. Addressing these issues is essential for the successful implementation of mentoring programs in medical education.

CONCLUSION

Mentorship-based interactive educational technologies significantly improve analytical thinking, academic performance, and professional competencies among medical students studying hygiene.

The integration of mentoring, case studies, problem-based learning, group discussions, and reflective analysis creates an effective educational environment that supports independent learning, professional development, and evidence-based decision-making.





The findings support the wider implementation of mentorship-based educational technologies in hygiene and medical ecology courses and other medical disciplines.

Recommendations

- Develop professional training programs for mentors and faculty members.
- Create digital educational resources and methodological guidelines.
- Establish a repository of real-life hygiene case studies.
- Expand small-group mentoring practices.
- Integrate digital platforms and artificial intelligence tools into hygiene education.
- Develop standardized mentoring assessment criteria.
- Encourage mentorship-based student research activities.
- Promote interdisciplinary integration of mentoring approaches.
- Apply reflective learning strategies regularly.
- Include mentorship-based interactive technologies in medical education curricula.

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