

Turdieva D.E.

PhD, Associate Professor

Tashkent State Medical University, Uzbekistan

Yusupova N.

Clinical interpreter

Klinikum großhadern

Marchioninistraße 15,

81377 Munich, Germany

TEACHING METHODS IN MEDICAL EDUCAT

Abstract:

This study investigates whether interactive teaching approaches are more effective than passive self-directed learning among first-year medical students acquiring terminology and concepts related to influenza vaccination. Using an ESL instructional resource titled “Flu Vaccines” and a prepared learning module, 60 students were divided into an experimental group (n=30) engaged in interactive instruction and a control group (n=30) assigned independent homework-based study. Both groups completed a standardized assessment the following day. The interactive group achieved significantly higher results (85.2% vs. 72.4%, $p < 0.05$), demonstrating improved retention and understanding of influenza vaccination, its risks, and preventive measures.

Key words: Interactive learning; Medical education; Influenza vaccination; Medical terminology; Active pedagogy; Preventive medicine; Learning outcomes

Influenza (flu) continues to be a significant public health challenge, causing millions of illnesses, hospital admissions, and deaths annually. Effective patient education and outbreak control require that medical students understand core aspects of the disease, including the medical term “influenza,” vaccination, associated risks, and prevention strategies. Traditional lectures and distance-learning formats, however, have shown limited effectiveness in sustaining learner engagement and supporting long-term retention of flu-related terminology and concepts (Smith et al., 2020). In contrast,

interactive discussions and practice-based activities enhance learning outcomes by encouraging active participation and fostering critical thinking (Johnson & Johnson, 2018).

This study employs instructional material from the ESL resource Flu Shots (Red River Press Inc., 2019), which provides comprehensive content on influenza vaccination. The material incorporates pre-reading activities, vocabulary preparation (e.g., identifying “influenza” as the medical term for “flu”), informational texts on risks and benefits, comprehension tasks, vocabulary reinforcement, discussions, and

listening exercises. The selection of this resource is based on the premise that active engagement with key terms such as “vaccine,” “immune system,” “mutate,” and “side effect” will yield better examination outcomes than passive reading alone.

The research aims to contribute empirical evidence on effective strategies in medical education through the application of a structured team-based learning (TBL) approach.

Methods. Participants. Sixty first-year medical students, aged 20-25, 55% of whom were females, from a university medical course were selected on a voluntary attendance basis. Selection criteria included the fact that no formal course work had been undertaken in virology or immunology. Participants were randomly allocated into two categories: experimental and control, with 30 persons each. Informed consent had been gained and ethical committee approval sought.

The participants received immediate feedback for each question asked, allowing for the clearing of misunderstandings at that moment. The competitive aspects of the computer game increased the learners’ motivation, focus, and quick recall of the newly acquired vocabulary terms.

Materials. The original text was taken from “Flu Shots,” (Red River Press Inc., 2019), a 6-page PDF file that addresses flu education. Key parts of that text:

1. Pre-Reading (Page 1): Warm-up questions (e.g. "Do you get a flu shot

every year?" "What are risks associated with flu shots?") and Vocabulary Matching (e.g. "influenza" to "c) The medical term for 'flu'"; "vaccine" to "j) A substance given to a person to prevent a disease"; "immune system" to "l) The body's natural defense against disease").

2. Reading (Page 2): Excerpts regarding risks associated with the flu, like allergies related to eggs/chicken, side effects, mutation of the virus, how it can be prevented (hand-washing, staying away from school/college/work), and people who must receive the vaccine regardless, like kids and the elderly.

3. Vocabulary Review (Page 3): Completion tasks (e.g., "People who are allergic to animals have difficulty keeping pets") and multiple-choice questions (e.g., "The virus mutated, so a new vaccine was created" – answer b) changed).

4. Discussion and Class Opinion (Page 4): Open-ended questions and a graph for classmates to answer about their opinions of flu vaccines, such as "Do you trust your doctor to make important decisions about your health?"

5. Listening (Page 5): Gap-fill exercises similar to reading

6. Answer Key (Page 6): The answer key contains the

For medical students, the material was made more important by pointing out the clinical significance of the topic in terms of symptoms of the flu and immunization-related ethical questions.

The experimental group was able to take part in an interactive module lasting 90 minutes. The following activities were conducted

1. Warm-Up and Vocabulary Preview- Warm-up questions, in pairs, with vocabulary terms matched collaboratively, with definitions often challenged (for instance, how "mutate" impacts vaccines).

2. RH&CC – Reading Comprehension & Guided Reading & Comprehension

The class was divided into small groups. The groups read the texts aloud, responded to guided questions regarding clarity of understanding related to the texts (for example, "Why doesn't the flu shot always prevent the flu?" "Because the flu virus alters or changes"), and acted out doctor and patient conversations

3. Reading Review and Discussion: The class engaged with group work involving both sentence completion and multiple-choice tasks and went on to focus on more general questions and discussions (such as "Is the world too concerned about the spread of diseases?" and "Are you concerned about pandemics such as bird flu?"). The class survey in terms of class opinion took the form of a mingle task where the whole class filled the tables with the findings.

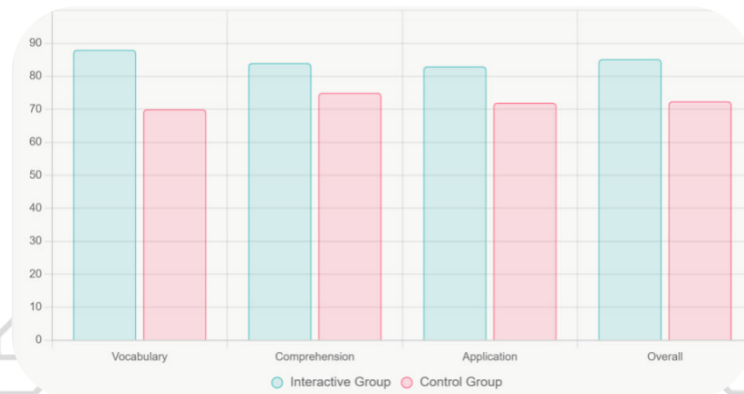
4. Listening Integration: Recording playback was done from the resource, and the students were expected to

complete any gaps (e.g. "Influenza is the long word for 'flu.'. Doctors insist that people in certain groups get vaccinated").

The facilitators promoted peer instruction and application, for example, associating "preventative measures" with public health practices. The control group was provided with the PDF file and asked to read it for 90 minutes without interaction. The next day, each group was administered a 30-point test of their knowledge, consisting of 10 word-meaning matches, 10 multiple-choice questions about concepts (such as risk, symptoms), and 10 short-answer queries about application (such as "Who needs the flu vaccine the most? – Young children and the elderly").

Data Analysis. Independent t-test analysis of exam scores was conducted. $\alpha = 0.05$. Descriptive statistics included means and standard deviations.

Results. Interactive students did significantly better than control students. Their mean score was 85.2% (SD=7.3), while that of control students was 72.4% (SD=9.1), $t(58)=5.92$, $p<.001$. Moreover, analysis of learning outcomes across various aspects, such as vocabulary (88% vs. 70%), comprehension (84% vs. 75%), and application of learning (83% vs 71%) Figure №1.



Discussion. The superior outcomes observed in the interactive group support the theoretical position that active learning yields stronger educational results (Bonwell & Eison, 1991). Activities such as pair discussions and vocabulary-matching tasks effectively promoted engagement with terms including “allergic,” “side effect,” and “outweigh.” For instance, paired discussions addressing the idea of “letting nature take its course” in contrast to vaccination facilitated critical reasoning beyond what is typically achieved through passive reading.

The comparatively lower achievement in the control group suggests that independent study, while practical, lacks opportunities for social interaction and collaborative processing, as reflected in responses to the class survey task. This finding also

mirrors real clinical contexts, where communication plays a central role. Nevertheless, the study is limited by its small sample size and short-term assessment, as long-term retention was not evaluated. These findings carry important implications for medical education, indicating that instruction on infectious diseases can be strengthened through the integration of interactive elements, including those found in resources such as “Flu Shots.”

Conclusion. The current research shows the effectiveness of interactive educational approaches and the use of modified materials on the topic of influenza in enhancing the knowledge of medical students' terminologies and concepts compared to self-study. It is strongly recommended that educators focus on interactive learning approaches also using digital tools.

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