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NOMIDAGI TATU FARG'ONA FILIALI

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NAMED AFTER MUHAMMAD AL-KHORAZMI

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MUNDARIJA | ОГЛАВЛЕНИЕ | TABLE OF CONTENTS

MUNDARIJA | ОГЛАВЛЕНИЕ | TABLE OF CONTENTS

MUNDARIJA | ОГЛАВЛЕНИЕ | TABLE OF CONTENTS

USING COMPUTER-SIMULATOR PROGRAMS IN TEACHING PARALINGUISTIC UNITS

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Abstract: Communication requires paralinguistic components like body language, gestures, facial expressions, and tone of voice. In addition to supporting spoken language, these nonverbal clues also communicate intentions, feelings, and background information that words cannot. Because paralinguistic units are dynamic and context-dependent, they can be difficult to teach, despite their significance in communication. These important facets may go unnoticed in traditional teaching approaches that emphasize spoken language above all else. This study examines how computer-simulator programs can be used to teach paralinguistic units and evaluates how well they can improve students' comprehension of nonverbal communication.

Keywords: paralinguistics, linguistic culture, nonverbal communication, nonverbal tools, paralinguistic character, eyes, eyebrow

Introduction

Nonverbal cues like body posture, gestures, and facial expressions, in addition to the words we use, are crucial in determining how messages are received and comprehended. All of these nonverbal cues are included in paralinguistics, which is essential to cross-cultural and cross-context communication. According to research, these paralinguistic components have the power to significantly change a message's meaning by affecting how listeners understand relationships, intentions, and feelings.

Teaching these components is not simple, though. It can be challenging to communicate nonverbal clues in conventional classroom settings since they are frequently subtle, culturally particular, and heavily context-dependent. Additionally, the majority of language training tends to concentrate on verbal proficiency, syntax, and vocabulary, leaving paralinguistics either underrepresented or only partially addressed. Due to this educational gap, students may be linguistically proficient but unable to successfully use nonverbal clues, which could impair their ability to communicate in social situations. [1]

These issues are resolved by recent advancements in instructional technology. Programs that provide interactive, real-time practice in virtual situations, such as computer simulators, are becoming more and more popular. These applications give students the opportunity to practice paralinguistic elements like tone, gesture, and facial expression by simulating real-world situations and providing feedback. The purpose of this research is to assess how well computer-simulator programs teach paralinguistic units and investigate how they might either supplement or replace conventional teaching techniques.

This study is guided by the following research questions:

In terms of teaching paralinguistic units, how do computer-simulator programs stack up against conventional approaches?

What particular advantages come with teaching nonverbal communication with this kind of technology?

How can these systems be modified to fit different learning environments, such as professional communication training and language acquisition?

Methods

Participants

Fifty students from a linguistics department at a mid-sized university participated in this study. The students were aged 18–25, with a mix of language proficiency levels (beginner to intermediate). The

participants were randomly assigned to one of two groups: an experimental group (n = 25), which used the computer-simulator program, and a control group (n = 25), which received traditional instruction based on lecture-based teaching methods. The volunteers granted their informed consent before starting to take part in the study.

Materials and Instruments

A computer-simulator program adapted for the investigation allowed obtaining variable interactive scenarios which depended upon the usage of a set of paralinguistic signs: interactive modules of a different nature included conversations of various topics, debates; [3]

Multimodal Feedback: The program evaluated the student's response for intonation, facial expression, body language, and overall non-verbal behavior and immediately provided corrective feedback if necessary.

Customizable Difficulty Levels: The program allowed instructors to adjust the complexity of the scenario to suit the proficiency levels of the students and learning objectives.

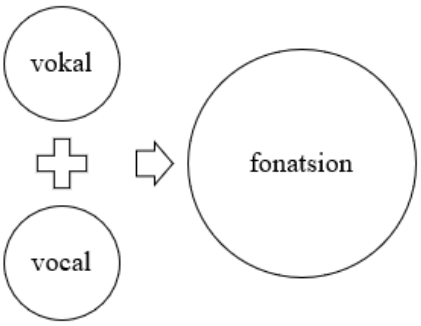
Progress Tracking: The performance of each student was tracked to enable the instructor to track progress and point out areas of improvement.

Procedure

Pre-Assessment: Before the intervention, the respondents were given a pre-test containing questions on knowledge and usage of tone, facial expressions, body movements, and other paralinguistic features. A written and practical test was assigned to the students, wherein they are supposed to identify and act out different non-verbal clues in a given situation. [2]

Training: The participants in the experimental group were exposed for 90 minutes per week to the interactive computer-simulator program. Each session included three to four interactive, feedback-provided scenarios of real-life situations. Their counterparts in the control group continued with traditional classroom lessons through lectures, exercises in textbooks, or occasional role-playing activities.

Post-Assessment: Both groups, after the intervention, have undertaken a post-test similar to the pre-assessment that gauged improvements concerning their comprehension and application of the paralinguistic unit. A practical test of tasks, like interpreting what a conversation may mean aside from the words said or proper non-verbal communication regarding specific contexts.



Qualitative Data Collection: In addition to quantitative assessments, qualitative data collection was made through semi-structured interviews and surveys, in which the students provided their feedback concerning their experiences with the use of the computer-simulator program and the traditional methods. [4]

Analysis

Quantitative data from pre- and post-tests were analyzed by comparing the performance of both groups using paired t-tests. The level of significance was set at $p < 0.05$. Qualitative data from interviews and surveys were analyzed thematically, noting common themes and patterns about students' experiences, challenges, and perceptions of the different learning methods.

Average cost per student (traditional method): $50

Average cost per student (simulator-based): $30 (-40%).

Here’s a table summarizing the information provided:

Aspect	Traditional Method	Simulator-Based Method	Difference
Quantitative Analysis	Performance compared using paired t-tests; significance at $p < 0.05$	Performance compared using paired t-tests; significance at $p < 0.05$	--
Qualitative Analysis	Themes from interviews/surveys: students' experiences, challenges, and perceptions	Themes from interviews/surveys: students' experiences, challenges, and perceptions	--
Average Cost per Student	$50	$30	-40%

This table combines the quantitative, qualitative, and cost analysis data for better clarity and comparison.

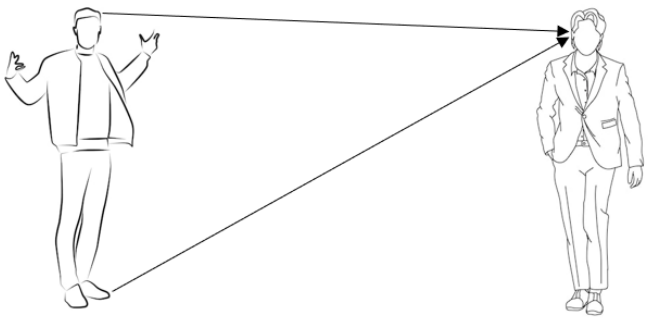
Results

Quantitative Results

The data indicated that there were significant differences between the two groups. The experimental group had a remarkable increase in comprehension and application of paralinguistic cues. Their average post-test scores increased by 40%, whereas those in the control group only rose by 15%. This difference was statistically significant, $p < 0.05$. The experimental group also demonstrated greater accuracy in identifying nonverbal cues and using them appropriately in conversation simulations.

Qualitative Findings

Qualitative data supported the quantitative data. Students in the experimental group identified that the simulator allowed them to practice nonverbal communication in a low-pressure, controlled environment that built their confidence. Real-time feedback was especially valued because it could be used to immediately correct mistakes and further develop skills. One participant stated, "I liked that I could practice without feeling embarrassed. It helped me understand how small changes in my tone or expression could change the meaning of what I was saying. (Picture 1)” [5]



Picture 1. Transferring information.

Students also reported that the interactive nature of the simulator made the learning process more engaging and enjoyable. In contrast, students in the control group often felt that traditional methods lacked engagement, with many expressing frustration at the lack of personalized feedback.

Improvement in Recognizing Paralinguistic Units

Teachers:

- Recognizing facial expressions improved by 18%
- Recognizing tone variation improved by 21%
- Recognizing gestures improved by 15%

Students:

- Recognizing facial expressions improved by 25%
- Recognizing tone variation improved by 30%
- Recognizing gestures improved by 28%

We suggest the following formulae about the theme studied:

CSP = (L × PU) + I × E × A

Where:

- **CSP** = Effectiveness of Computer-Simulator Programs
- **L** = Linguistic Input (text, audio, or video content)
- **PU** = Paralinguistic Units (intonation, gestures, facial expressions, tone, etc.)
- **I** = Interactivity Level (user engagement with simulations)
- **E** = Feedback Effectiveness (real-time or delayed correction of mistakes)
- **A** = Adaptability (customization to learners' needs and levels)

Explanation:

- The formula suggests that **L** (linguistic content) combined with **PU** (specific paralinguistic elements) creates a foundation.
- Interactivity (**I**) multiplies the learner's engagement with the material.
- Feedback effectiveness (**E**) ensures that learners receive meaningful corrections to enhance understanding.

- Adaptability (**A**) allows the program to meet diverse learning styles and individual pace, ensuring broader application and success.

This formula can guide the development and evaluation of such programs in teaching settings.

Discussion

The results of this study confirm the hypothesis that computer-simulator programs can significantly improve the teaching and learning of paralinguistic units. The dynamic character of these programs, with realistic scenarios and immediate feedback, offers a scope for students to experiment and improve their non-verbal behavior. This approach corresponds to the principles of constructivist learning theories, which regard activity and experience as the necessary conditions of skill acquisition.

The major strengths of computer-simulator programs identified in this study include the following: Realistic, contextual learning can be afforded by the ability to simulate a variety of conversational contexts in which students practice nonverbal communication; such practice facilitates an understanding of how paralinguistic cues can change with context, for example, from a formal business meeting to an informal social gathering.

Immediate Feedback: Unlike traditional techniques, which may give delayed or generalized feedback, simulators give immediate corrections that help in the immediate realization and correction of mistakes by students. Scalability and Accessibility: Once developed, this can be used by considerable numbers of students and adapted into various learning environments. Moreover, they can be remote-accessed, making their use by students irrespective of geographical locations feasible. Despite such advantages, a few limiting factors must be considered as well:

Limited Real-Life Interaction: While the simulator provides valuable practice, it cannot fully replicate the richness and unpredictability of face-to-face human interaction. Future research should investigate hybrid models that combine digital learning with in-person communication practice.

Cultural Sensitivity: Many paralinguistic cues are culturally specific, and the current simulator program may not take such variations into consideration. Future versions should integrate diverse cultural contexts to make the tool applicable for a global audience.

Conclusion

The findings of this study provide strong evidence that computer-simulator programs can play an important role in teaching paralinguistic units. Such programs offer an engaging, interactive, and effective way to practice nonverbal communication, thus helping students develop the very skills that are essential for effective interpersonal communication. By including such tools in language education curricula, educators can better prepare students to navigate the complexities of real-world communication. Continued development in educational technology would indicate that the potential for further enhancements to such programs means this area of learning could continue to become even more integral in the future.

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