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Responses and Challenges of Indonesian Prospective Elementary Teachers Interacting with Australian Avatar Students

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Abstract

The quality of teaching is a critical factor in educational success, and innovative tools like SimLab offer promising opportunities for enhancement. This research aims to analyze how SimLab user responses contribute to the development of teaching skills among students and to identify the challenges encountered during its implementation. A mixed-methods approach was employed, involving bilingual PGSD students from Unesa as the subjects of the study. Data were collected through a combination of surveys, interviews, and observations, with analysis conducted using both quantitative and qualitative methods. The findings indicate that SimLab significantly enhances various aspects of teaching proficiency, such as boosting self-confidence, improving the effectiveness of lesson delivery, engaging avatar students, interpreting avatar student body language and voice, providing constructive feedback, and fostering relationships with the avatars. However, the research also uncovers several challenges students face, including academic difficulties in adapting teaching methods to diverse student profiles, cultural obstacles related to the student's cultural adaptation, and technical challenges, such as unstable internet connections and limited technological facilities. The study concludes that while SimLab has substantial potential as a tool for preparing competent future educators, addressing these challenges is crucial for maximizing its effectiveness.

Keyword: *SimLab, Microteaching 2.0, Bilingual PGSD.*

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INTRODUCTION

Microteaching is a course that is globally used in teacher education programs as a strategy that combines reflective practice and a conditioned teaching approach (Ledger et al., 2019). In microteaching, students do not teach as a whole class, but the lesson design is shortened and focuses on developing specific teaching skills. This shortened lesson design aims to allow students to practice, reflect, and receive useful feedback to increase their confidence in teaching and develop effective teaching strategies (Ajayi-Dopemu & Talabi, 1986; Arsal, 2014; Benton-Kupper, 2001; Kpanja, 2001; McLean Davies et al., 2015)

So far, microteaching is usually conducted face-to-face between students and real students. However, global education experts consider that this approach is not always ideal, especially for prospective teachers with no teaching experience. According to (Ledger, 2019), placing novice teacher candidates in real classroom conditions with real students is not ideal, as they have not had the opportunity to demonstrate

their abilities and sometimes receive feedback they do not need. Therefore, technology is seen as a solution to bridge the gap between prospective teachers' preparation and their real-world application in schools (Rappa et al., 2022; Savas, 2012).

Various technologies have been used in microteaching, such as the use of videotape recording that allows students to teach in front of their peers, and then the recordings are discussed for observation analysis, reflection, and feedback (Borg, 1968; Brent et al., 1995; Kilic, 2010). In Indonesia, especially in the Department of Elementary School Teacher Education (PGSD) at Surabaya State University (Unesa), microteaching is a compulsory course before students do Field Experience Practice (PPL). Students need to provide teaching skills during microteaching to practice before they go to school and deal directly with students.

Murdoch University in Australia developed a virtual microteaching technology called Microteaching 2.0, or Simulation Laboratory (SimLab). In Microteaching 2.0, virtual students live-voiced by Murdoch University's SimLab staff interactors are called avatars. Each avatar represents certain characteristics of primary school students in Australia so that they can respond directly to the students practicing teaching in front of them as the staff interactor animates the avatars. The collaboration between Murdoch University and Unesa allows SimLab technology to be tested on PGSD Unesa bilingual class students. This technology allows students to practice teaching with avatars that represent the characteristics of primary school students in Australia. This experience is precious for PGSD bilingual students to teach in English and understand the characteristics of students from different cultures.

The PGSD Department of FIP Unesa is committed to producing prospective elementary school teachers with global qualifications and can adapt to the demands of the 21st century. Since 2017, the PGSD Department has initiated a bilingual class as a superior class, containing selected students based on English Proficiency Test (TEP) scores and interviews in English. The bilingual class curriculum enriches the content with global issues of education and 21st-century skills. The use of Microteaching 2.0 technology in PGSD bilingual classes not only provides practical experience in teaching but also allows students to develop teaching skills in more depth. According to Ledger & Fischetti (2020) research, this technology increases the confidence of student teachers and can diagnose their weaknesses and teaching skill improvement needs. This technology is particularly relevant to the pandemic situation, allowing microteaching to be conducted online through platforms such as Zoom, with SimLab staff at Murdoch University, students in their homes, and lecturers as observers.

This research aims to describe the teaching skills that PGSD bilingual class students can develop through SimLab, capture their responses to the use of Microteaching 2.0 technology, and describe the academic cultural challenges that students encounter when interacting with avatar students controlled by native Australian SimLab technicians. This research collaboration is expected to initiate the development of similar technology at the Faculty of Education, with a structured research roadmap. Through this study, it is hoped that Microteaching 2.0 technology can be adapted and implemented more widely in Indonesia, making a significant contribution to improving the quality of teacher education and preparing them to face challenges in the global education world.

Over the years, various technologies have been used in microteaching to improve student teaching performance. One of the earliest technologies used was videotape recording. In this approach, students who are practising teaching in front of their peers are recorded, and the recordings are then discussed for observation analysis, reflection, and feedback (Borg, 1968; Borg et al., 1969; McKnight, 1971). This approach proved to be effective in improving students' teaching skills and provided them with an opportunity to review and evaluate their performance. However, as technology evolves, the approach to microteaching also continues to evolve. Ledger (2019) noted that more advanced technologies, such as avatar simulations, are being used to provide a more realistic and interactive teaching experience for student teachers. These simulation technologies allow university students to interact with human-controlled virtual students, providing immediate feedback and more dynamic responses.

SimLab Microteaching 2.0, developed by Murdoch University, is one example of this innovative simulation technology. This technology uses avatars controlled by staff interactors to represent students with various characteristics. These avatars can interact with students in real-time, providing appropriate responses to the designed learning scenarios. This allows students to experience teaching close to real classroom conditions without the pressure of real students. The collaboration between Murdoch University and Unesa is an example of international collaboration aimed at improving teacher education quality through advanced

technology. Microteaching 2.0 technology developed in Australia is now piloted in Indonesia, specifically for Unesa PGSD bilingual students. This collaboration enables technology transfer and allows the exchange of knowledge and best practices between the two countries.

The PGSD FIP Unesa Department, committed to producing globally competitive elementary teacher candidates, sees this collaboration as a strategic step to prepare their students for the challenges of the 21st century. By using SimLab technology, students practice teaching in English and adapt to the characteristics of students from different cultures. This experience is invaluable for their professional development as future teachers.

Several previous studies have been conducted to see the impact of using technology in student microteaching practice. Ledger & Fischetti, (2020) By practicing this technology before meeting face-to-face with real students, student teachers became more confident and felt more prepared to face students in the classroom. According to the results of their research, this technology can also be used to diagnose the weaknesses and needs of prospective student teachers in Australia and to improve their teaching skills. With the video recording in SimLab, other researchers Ledger (2019) also found it easier to identify the learning strategies and models often chosen by student teachers in Australia. Furthermore, according to Ledger (2019), for sustainability, it is necessary to test SimLab not only in Australia but also in other countries. So this research will see how the results of the Simlab 2.0 trial for microteaching technology for students in Indonesia, in this case, PGSD FIP Unesa bilingual students.

This study aims to capture the responses of PGSD bilingual students to teaching using Microteaching 2.0 technology and describe the academic, cultural, and language challenges that PGSD bilingual students encounter when interacting with avatar students controlled by a native Australian SimLab technician.

METHODS

The collaborative research aims to identify the teaching challenges of student teachers in Indonesia with monitoring and guidance from three universities: Universitas Negeri Surabaya, Murdoch University, and the University of Newcastle. Based on the problem formulation presented in the background section, this research design uses a mixed-methods approach. This research combines data obtained from observations, surveys, FGD (Forum Group Discussion), and narrative writing during the 10 months of online research. Observations were made during the implementation of the SimLab trial and by repeatedly observing the video recording of the implementation. Surveys were conducted by administering questionnaires developed by Murdoch University to students who had conducted SimLab trials. Survey data will be analyzed quantitatively and descriptively using percentages and diagrams. After each rehearsal or trial, FGDs were attended by students, course lecturers, teachers in Australia, and SimLab staff. Students were given constructive feedback during the FGD and expressed the learning gained from the display. Students wrote reflective narratives related to the SimLab trial that had been conducted. The data obtained from this method will be analyzed according to the theme patterns found to answer the proposed problem formulation.

The participants of this study consisted of 31 students from two PGSD bilingual classes who programmed microteaching and KMPM courses. The sampling technique used was purposive sampling, with students selected as those who had passed the Test English Proficiency (TEP) score to smooth communication during microteaching in English. According to the TEP score screening results, the research subjects consisted of 15 students from the 2018A batch and 16 students from the 2019A batch.

Data analysis in this study uses a mixed-methods approach that combines quantitative and qualitative analysis. Quantitative data was obtained from survey results using a questionnaire from Murdoch University, covering aspects of teaching skills and challenges faced by students after SimLab sessions. The steps of quantitative analysis included data collection, coding, descriptive analysis using basic statistics such as mean and median, and presenting results in tables and diagrams for easy interpretation. Qualitative data was obtained from observations, FGDs, and students' narrative writing. Qualitative analysis involved data transcription, thematic coding, identification of main themes, content analysis, and triangulation of data from multiple sources to ensure consistency of findings. The two analyses were combined to validate the findings, identify relationships between quantitative and qualitative data, and develop recommendations for developing Microteaching 2.0 technology in the context of teacher education in Indonesia.

RESULTS AND DISCUSSION

The use of SimLab successfully developed various aspects of students' teaching skills. From the questionnaire results, it can be observed that students felt significant improvement in several skill areas.

Student User Response

Student users' responses to the teaching exercise using SimLab technology increased their confidence, effectiveness of delivering the lesson, engagement of the avatar students, body language and voice of the avatar students, providing feedback, and building rapport with the avatar.

Student Confidence

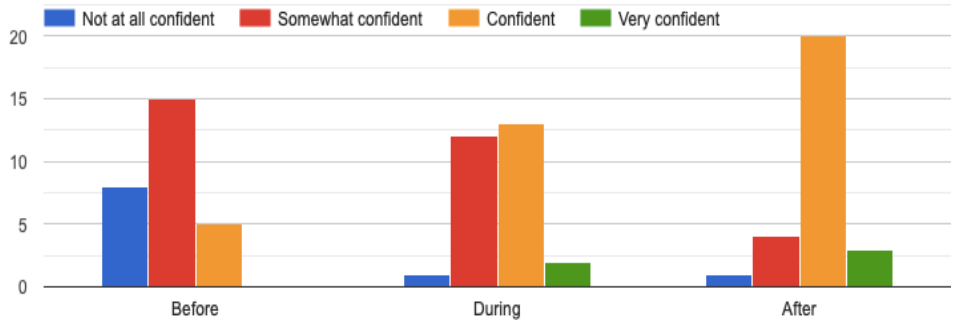

Figure 1: The role of SimLab in increasing student confidence

Based on the responses and diagrams above, it appears that before SimLab, many students lacked confidence due to their lack of English language skills, teaching skills, and interaction with students. However, after SimLab, confident students are dominant, although there are also less confident students. The emergence of confidence is due to the friendly and comfortable learning environment of SimLab and its facilitators. Avatar students seem real in their responses and behavior, know the importance of awards given to students, practice English language skills, improve performance, get good responses from principals and avatar students, and learn from failures in simulations.

Effectiveness of Delivering the Lesson

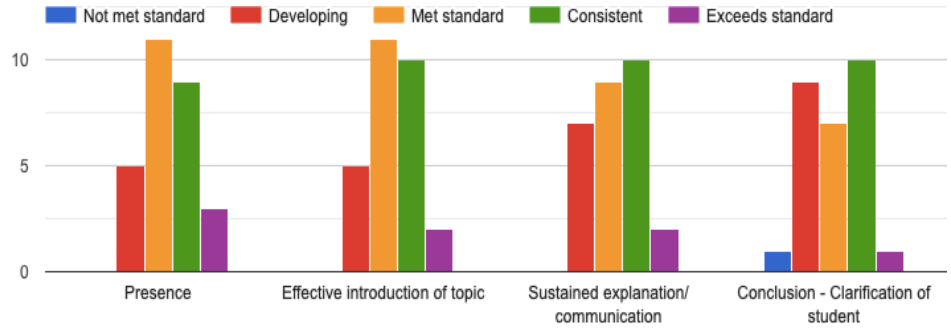

Figure 2: Effectiveness of SimLab in Learning

Based on the diagram and responses above, the effectiveness of microteaching lesson delivery has several supporting indicators. The first indicator, attendance, states that students have met the standard. The second indicator, namely effective topic introduction, also states that it has met the standard. Then, the third indicator, namely explanation or continuous communication, states that students have been consistent. Then, the last indicator of clarification of student conclusions states that students have been consistent. Thus, it can be concluded that the delivery of microteaching lessons is considered effective even though network connection constraints can be resolved immediately.

Avatar Student Engagement

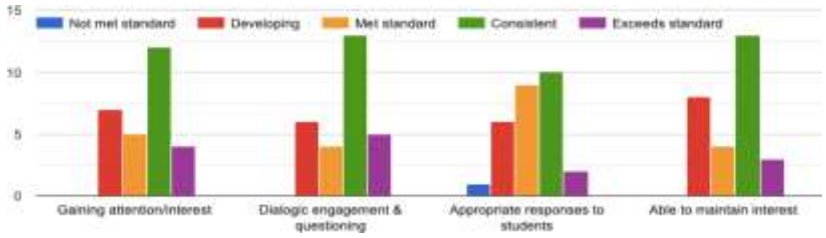

Figure 3: Avatar; Student Engagement

Based on the diagram and respondents' responses above, it appears that responding to the simulation experience with the subheading of engagement has several indicators of success, including the first indicator, namely getting attention or interest, states that students have been consistent; the second indicator, namely dialogical engagement, and questions states that students have been consistent; and the third indicator, namely appropriate responses for students, states that students have been consistent but that few students have met the standard. As well as the fourth indicator, namely maintaining interest, states that students have been consistent, but compared to half, it appears that students must develop it again. Thus, it can be concluded that student engagement meets the standard.

Avatar students' body language and voice

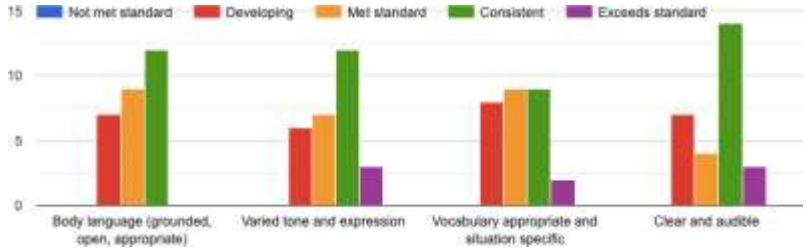

Figure 4: Body Language and Voice of Avatar Students

Based on the diagram and respondents' responses above, it appears that responding to the simulation experience with the subtitles of body language and voice has several indicators. The first indicator, namely body language, states that students have been consistently seen compared to a few students who meet the standards; the second indicator, namely varied tones and expressions, states that students have been very consistent; the third indicator of vocabulary is appropriate in certain situations states that 50:50 between students are consistent with students meeting standards and compared slightly with development students; and the fourth indicator, namely clear and audible, states that it is very consistent seen from the far difference between the others. Apart from that, some students experienced problems with internet connections and facilities. Thus, using body language and voice can be concluded to meet the standards.

Feedback

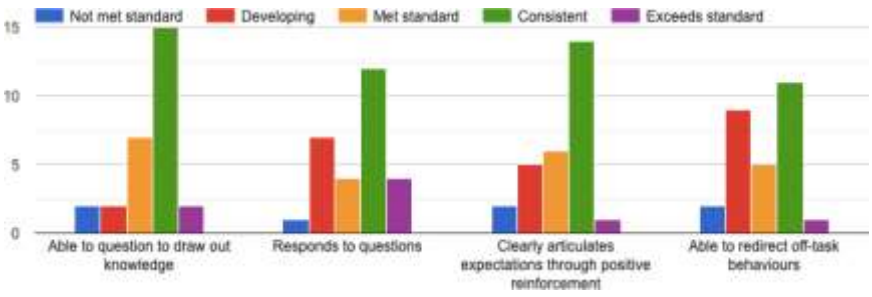

Figure 5: Feedback on SimLab

Based on the diagram and respondents' responses above, it appears that responding to the simulation experience with the subheading of feedback has several indicators. The first indicator is being able to ask questions to gain knowledge; it can be seen that students are very consistent; the second indicator is responding to answers; it can be seen that students are consistent even though some students need development; the third indicator is clearly articulating positive reinforcement expectations, it can be seen that students are very consistent, then the fourth indicator is being able to divert task behavior, it can be seen that students are consistent but not a few students need development. However, some students experienced problems with internet connection, time constraints, a lack of English language skills, a different vocabulary, and difficulty focusing. Thus, by providing feedback, it can be concluded that it meets the standard.

Building Relationships with Avatar

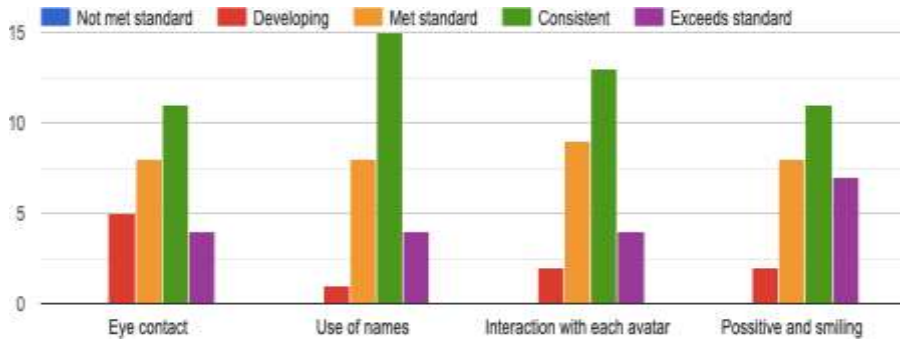

Figure 6: SimLab Helps Build Relationships with Students

Based on the diagram and respondents' responses above, responding to the simulation experience in a mixed reality learning environment (MRLE) has several indicators. The first indicator, eye contact, shows that the display still needs to be developed to attract attention. The second indicator, namely the use of names, looks consistent, even though some students need attention. The third indicator, interaction with avatars, shows that students are very consistent. Then, the fourth indicator, namely positive and smiling, shows that students are consistent, but not a few students need development.

Academic, Cultural, and Language Challenges

Next, we will present the survey results on the questionnaire that answers the third problem formulation: the challenges faced by SimLab user students when using the technology. This presentation will be categorized into three types of challenges students face: academic, cultural, and language.

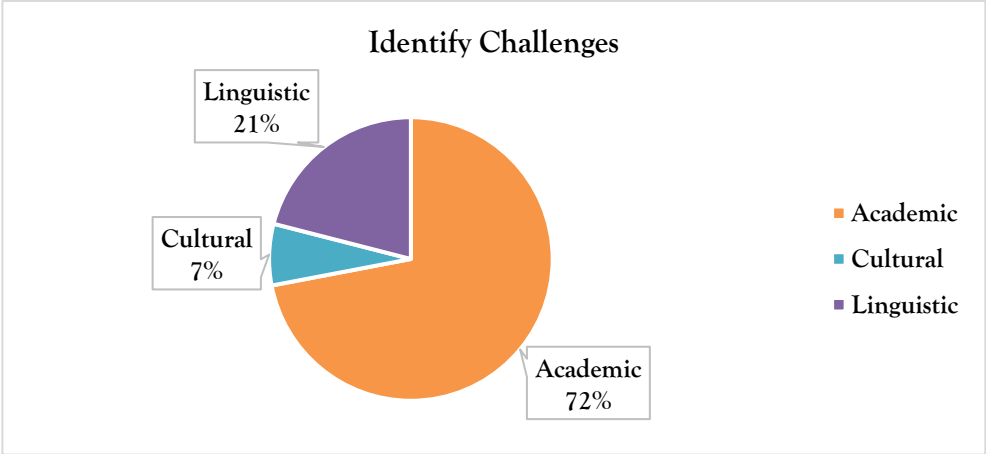

Figure 7: Challenges for SimLab Student Users

The pie chart shows that most of the challenges students face are academic. Most of the 72% who answered academic challenges as the biggest challenge revealed that they were challenged to teach according to student characteristics and adapt their teaching style to student characteristics. Student-focused learning is a challenge faced by most teachers in Indonesia because they are usually more focused on delivering the material taught during learning without paying attention to the characteristics of students or responding to individual students' difficulties. This academic culture needs to continue to be provided to prospective teacher students. The next challenge for bilingual students is language use. So far, they only use passive English and rarely communicate in English. SimLab Interactor helps them develop their language skills. The final challenge is related to cultural differences. Students consider the appropriate context for Australian students in designing learning and the media used.

Discussion

This research shows that SimLab 2.0 Technology effectively develops prospective teacher students' teaching skills. Students report an increase in the creation of a variety of learning methods that can increase student interest and engagement, repeating results of Ledger & Fischetti (2020). They also develop effective questioning skills, supporting students' dynamic interactions and critical thinking. SimLab helps students hone their small group and individual teaching skills, supporting students' individual learning needs.

Students' positive response to SimLab reflects the positive impact of developing various aspects of learning. *First*, SimLab increases students' confidence in overcoming teaching challenges, especially in English language skills, interaction with students, and teaching skills, repeating the results of Abdullah et al. (2023). *Second*, SimLab is effective in supporting an effective lesson delivery process, such as maintaining attendance, introducing topics well, explaining material comprehensively, concluding lessons, repeating the results of Ledger (2019). *Third*, interactions with student avatars in SimLab were rated as successful with good responses, engagement in dialogue, and relevant responses, repeating results of Lutfiwati (2020). *Fourth*, the student avatar's use of body language and voice was considered consistent despite technical challenges such as internet connections, repeating results of Ledger & Fischetti (2020). *Finally*, SimLab provides constructive feedback to students, including the ability to ask questions, respond to answers, articulate positive expectations, and direct student behavior, repeating the results of Jabri et al. (2023). Although some areas need development, SimLab helps students build effective relationships with avatars, demonstrating their adaptability to technology-based learning environments.

This research identifies several challenges students face in using Laboratory Simulation (SimLab), especially in academic, cultural, and linguistic contexts. *First*, the main challenge is the adaptation of teaching styles according to individual student characteristics, which is often overlooked in conventional education. SimLab provides opportunities for more personal interaction with student avatars but still requires deeper skills of interpretation and adaptation to diverse learning situations (See et al., 2023). *Second*, cultural challenges are reflected in students' difficulties adapting learning contexts to different student cultures, emphasizing the importance of preparing students to interact effectively with students from different cultural backgrounds (Sarı & Yüce, 2020). *Third*, language challenges are a significant barrier for some students (Kamaşak et al., 2021). Although SimLab helps in the development of language skills, additional support is needed to ensure effective communication (Mason et al., 2020). *Fourth*, unstable internet connections or limited technological facilities can disrupt students' learning experience with SimLab, even though this technology is designed to support dynamic learning (Hayden, 2022). *The last*, the use of technology in education requires high levels of motivation and mental resilience from students to overcome technical and emotional challenges that may arise during the learning process (Hofer et al., 2021).

The findings of this study have significant implications for the development of the field of teacher education. SimLab 2.0, by fostering critical teaching competencies, holds the potential to revolutionize the training of future educators. The technology's ability to simulate real-world teaching scenarios provides an immersive learning experience that traditional methods cannot replicate. These findings suggest that integrating SimLab into the teacher education curriculum could be a strategic move to prepare a generation of teachers who are competent and adaptable to the demands of modern classrooms. This aligns with the growing body of research advocating for the inclusion of simulation technologies in education (Hofer et al., 2021; Ledger & Fischetti, 2020).

However, this study is not without limitations. The reliance on student self-reports may introduce bias, as students may overestimate their skill development due to their positive experiences with the technology. Furthermore, the study's scope was limited to a specific group of bilingual PGSD students, which may not fully capture the broader applicability of SimLab across diverse educational contexts. The technical limitations encountered, such as unstable internet connections, also suggest that the findings may not fully reflect the potential of SimLab in well-equipped settings (Went, 2019). Future research should consider a broader sample, including non-bilingual students and those from different educational backgrounds, to test the generalizability of these findings. Additionally, addressing the technical barriers identified in this study will be crucial for maximizing the effectiveness of SimLab. Upgrading technological infrastructure and providing additional language support could enhance the learning experience, making SimLab a more universally applicable tool in teacher education.

The use of SimLab in education offers great potential for developing students' teaching skills. Despite facing challenges such as adapting teaching styles to diverse student characteristics and language and technology barriers, SimLab provides an immersive learning experience. With the support of adequate technological infrastructure and improvements in student skills development, SimLab can become an invaluable tool for improving the quality of education in the future. Integrating SimLab into the education curriculum could be a strategic step to prepare a generation of teachers who are more competent and ready to face real-world challenges. In conclusion, while this study reaffirms the effectiveness of SimLab in developing teaching skills, it also highlights the need for ongoing improvements in technology and pedagogy. Integrating SimLab into teacher training programs could be a pivotal step in advancing educational quality, provided that the challenges identified are adequately addressed. This research contributes to the growing discourse on the role of technology in education, emphasizing the need for innovative solutions to prepare future educators for the complexities of modern teaching.

CONCLUSION

Based on the data collected, this research concludes that SimLab 2.0 is an effective tool for improving teaching skills among student teachers, with most participants responding positively to its implementation. However, the students faced academic challenges, especially adapting to cultural and language differences in the simulated environment. These challenges underscore the importance of considering diverse student characteristics in teacher training. To build on these findings, future research should explore the application of SimLab in different scenarios, such as interactions with parents or fellow teachers, and involve students from different academic departments to assess the broader applicability of this technology in diverse educational contexts.

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