



Integrating Pro-Tech Learning into a Sociolinguistic Approach Through Practitioners' Involvement for Multicultural Awareness

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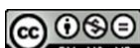
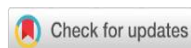
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ABSTRACT

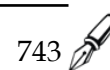
This research aims to enhance multicultural awareness for university students through the integration of Pro-Tech Learning in sociolinguistic instruction. A qualitative classroom action research design was employed through two instructional cycles consisting of planning, action, observation, and reflection. The participants were 19 undergraduate students of the English Language Education Department enrolled in a sociolinguistics course. Data were collected using questionnaires, classroom observations, performance-based projects, interviews, and documentation. The data were analyzed through descriptive quantitative analysis and paired-sample t-tests, supported by thematic qualitative analysis. The findings reveal a significant improvement in students' sociolinguistic conceptual understanding, learning engagement, and technology integration after the implementation of Pro-Tech Learning. Students demonstrated stronger critical analysis of sociolinguistic phenomena, increased tolerance, and greater sensitivity toward cultural and linguistic diversity. This study concludes that integrating Pro-Tech Learning with practitioner involvement effectively bridges theoretical knowledge and real-world sociolinguistic practice, thereby fostering inclusive and multicultural-oriented learning in higher education.



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INTRODUCTION

There is more to fostering sociolinguistic competence in higher education than traditional theoretical instruction. In today's era of globalization, universities are increasingly expected to prepare students who can navigate cultural and linguistic diversity with sensitivity and adaptability. According to Abakirov et al. (2025) and Chaika (2024), students who will become members of a modern, multicultural society require learning that is not only based on conventional methods but also directly involved in the learning process. The students need multicultural awareness to succeed academically and professionally before they face society (Khairul Zakaria et al., 2024). Unfortunately, the students' preliminary studies describe that the sociolinguistics class revealed significant pedagogical obstacles. Specifically, 78% of 19 undergraduate students demonstrated a limited understanding of multiculturalism due to monotonous and traditional learning processes and media. Consistent with Choi-Lundberg et al. (2023), the students should deal with the complexity of circumstances through creative, innovative, technology-based teaching that incorporates real-life experiences (Ariyanti, 2020; Choi-Lundberg et al., 2023).



Early-stage exposure to integrated technological and multicultural sociolinguistic learning may significantly influence students' long-term development of intercultural competence (Shadiev & Sintawati, 2020). Initial learning experiences in sociolinguistics give students insights that spark a deep and lasting enthusiasm for exploring the richness of cultures and the nuances of language throughout their lives (Bucholtz et al., 2015; Mallinson, 2025). Despite the recognized importance of multicultural and technology-assisted learning, many sociolinguistic classrooms still depend on lecture-centered learning. Consequently, students show limited ability to apply sociolinguistic theories in authentic intercultural contexts. (Chaika, 2024; Truong & Tran, 2014). This gap between the expected outcomes of multicultural competence and the reality of passive, theory-centered instruction highlights the need for a more dynamic pedagogical model. Unlike previous studies that focused solely on theoretical or technology-assisted learning, this research introduces the Pro-Teach Learning model as an innovative framework that integrates practitioner experience to promote deeper multicultural awareness and practical application of sociolinguistic concepts in higher education.

The practitioner's integrated pedagogy of Pro-Tech Learning may offer enhanced possibilities for sociolinguistic learners in multicultural contexts. This innovative Pro-Tech Learning, combined with the sociolinguistic module and practitioner role, creates an engaging, contextually relevant learning environment for students. The integration of this learning enables one to gain deep understanding of sociolinguistic diversity within their immediate community context, informed by practitioner-related sociolinguistics (Crossley, 2020; Van Laere et al., 2016). The same statement about the role of practitioners is also described by the expert (Kim, 2020). The expert states that facilitating a deeper understanding of how language reflects and constructs cultural identity in everyday interactions can be achieved through problems presented by lecturers through using Pro-Tech Learning, which develops students' critical reading processes (Nurhayati, 2023). Students can develop theoretical knowledge and practical skills through the systematic integration of practitioner perspectives and technology-based learning experiences (Bozkurt & Yigit Koyunkaya, 2022; Widajati & Mahmudah, 2023), enabling them to communicate effectively across cultures in Indonesia's increasingly diverse social landscape, referred to as self-directed learning in social life (Simamora & Pasaribu, 2023). The main focus of this research is to respond to the students' learning needs in sociolinguistics, not only through the main theoretical text but also through relevant additional books, presented with a Pro-Tech Learning approach, in order to prepare them to actively participate in society (Isaacs, 2018; Mede & Dikilitas, 2015).

Traditional approaches, characterized by passive learning behavior and minimal student engagement, have been shown to be less effective in fostering multicultural awareness among students. Through classroom action research, students' learning challenges will be detailed (Tekin, 2017). This allows for empirical monitoring of sociolinguistic learning development across interactive cycles of planning, implementation, observation, and reflection. This cyclical process aligns with the research's urgency, specifically the development of students' multicultural sociolinguistic skills in society. Developing competencies stems from repeated exposure to practical activities, allowing students to cultivate a multicultural understanding within the community subconsciously. The cyclical nature of action research, encompassing planning, acting, observing, and reflecting, aligns perfectly with the dynamic requirements of multicultural sociolinguistic education (LeMire et al., 2019; Viyayanti & Dwikoranto, 2021), where competence develops through iterative exposure to diverse linguistic practices and systematic reflective analysis (Piccardo & North, n.d.; Slatyer, 2015).

As a result, the importance of this classroom action research extends beyond direct pedagogical improvements, as it also contributes to the development of outputs for language education, particularly innovative sociolinguistics in the context of higher education in Indonesia (Suherman et al., 2023). The same point also describes that using technology such as e-learning increases students' motivation and critical thinking processes (Fardani et al., 2022;



Septiviana & Abdurrahman, 2024). The integration of Pro-Tech Learning and its positive impact on multicultural awareness serve as empirical evidence for effective technology-based instruction, practice-oriented in preparing globally competent students. Applying and reflecting in cycles led to quick gains in students' intercultural skills and created a long-lasting teaching model that fits many Indonesian schools. This shows how important it is to use data to guide sociolinguistic education and help students respect different cultures.

Based on these gaps, this study set three primary research objectives, namely, to examine the advantages of implementing Pro-Tech Learning in sociolinguistics through practitioner involvement to foster multicultural awareness, to identify the challenges of implementing Pro-Tech Learning into a sociolinguistic approach through practitioners' involvement for multicultural awareness, and to analyze the student's motivation when engaging in Pro-Tech Learning supported by practitioner collaboration. The benefit of this research, first, is pedagogical: it provides empirical evidence for strengthening students' sociolinguistic competence, multicultural sensitivity, and technology-supported learning engagement. Theoretically and practically, it contributes to the development of an innovative, culturally responsive instructional model that can be adopted in higher education sociolinguistic courses across Indonesia. Overall, this study emphasizes the importance of continuous, participatory, and technologically responsive educational innovation. Its implications extend beyond pedagogical enhancement, contributing to the development of innovative sociolinguistic instruction in higher education in Indonesia.

Multicultural awareness is a crucial aspect of sociolinguistic development. It helps students value cultural diversity and communicate across linguistic communities (Griffith et al., 2016). In Indonesia, developing this awareness requires teaching that goes beyond theory into real, experience-based learning. Previous research shows that direct engagement with linguistically diverse environments improves students' empathy, adaptability, and sociolinguistic awareness (Zalli, 2024). This study uses attitudinal surveys, discourse analysis, and reflective journals to assess these developments. By integrating these methods, the research provides an in-depth, evidence-based analysis of students' empathy, adaptability, and sociolinguistic competence.

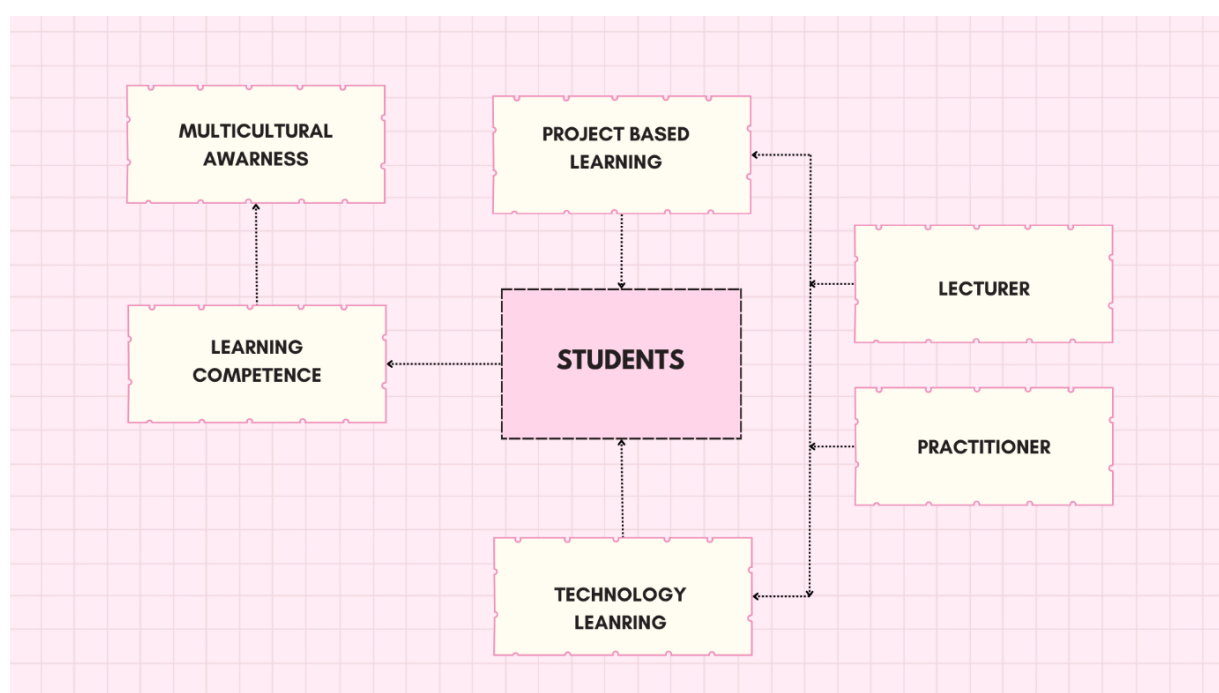


Figure 1. Pro-tech learning framework

Practitioners play a crucial role in bridging academic theory with students' real-world sociolinguistic experiences (Uzuner Smith et al., 2017). By guiding the application of theory within multicultural settings, practitioners foster students' linguistic skills and empathy. Despite this significance, their direct role in building multicultural awareness remains underexplored, particularly in technology-supported learning environments (Elvianasti et al., 2023; Gutierrez-Santiuste & Ritacco-Real, 2023). Current empirical research still lacks an in-depth analysis of how practitioners promote students' multicultural awareness.

Project-based Technology Learning (Pro-Tech Learning) is a constructivist and socially grounded pedagogical framework that integrates technology with project-based learning (Javier Ordoñez Procel et al., 2024; Shao & Yu, 2025). It aims to provide students with experiential, technology-supported engagement with real sociolinguistic phenomena. Pro-Tech Learning fosters collaboration, digital competence, and reflective thinking by integrating classroom instruction with authentic linguistic and cultural activities (Mallinson, 2025; Mustafa et al., 2024). This approach bridges theoretical learning and real-world practice, promoting deeper student engagement and intercultural understanding. Although Pro-Tech Learning shows significant pedagogical promise, its application in sociolinguistic education remains limited. Many educational institutions maintain content-centered approaches, often lacking collaboration with practitioners or integration of classroom-based research. Existing empirical studies on technology-mediated sociolinguistic instruction are limited, and few investigate its impact on multicultural awareness through systematic interventions. Therefore, Pro-Tech Learning represents a practical and innovative pedagogical tool for connecting theory with practice and fostering students' intercultural and metalinguistic competence.

RESEARCH METHOD

Research Design

This study employed a qualitative Classroom Action Research (CAR) design to investigate the integration of Pro-Tech Learning within a sociolinguistic approach for developing students' multicultural awareness. The research consisted of six weeks, with each comprising planning, action, observation, and reflection (Saharani, 2023). The first cycle introduced the Pro-Tech Learning model, while the second refined the implementation based on reflections from the first. This iterative design encouraged continuous improvement of teaching practices in sociolinguistic instruction through collaboration among researchers, lecturers, and students.

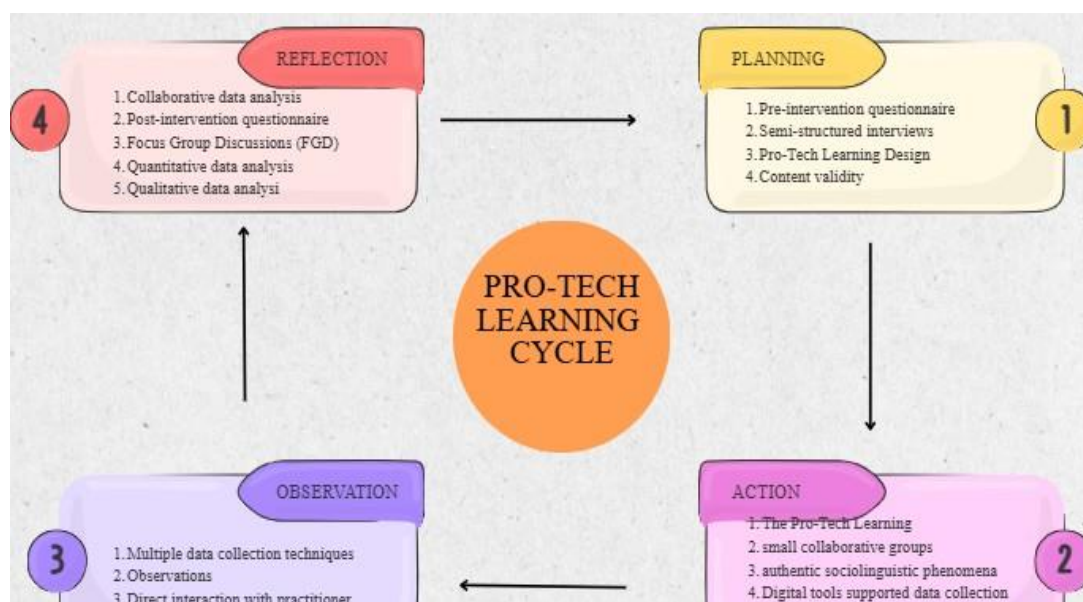


Figure 2. Pro-tech learning cycle

The study involved 19 students enrolled in the sociolinguistic course at the English Language Education Department at University of PGRI Mpu Sindok. All participants were selected through purposive sampling based on active course participation, basic technological literacy, and demonstrated linguistic competence. To strengthen the authenticity of the learning context, some practitioners' collaborators from multicultural community organizations contributed as external partners, providing real-life sociolinguistic cases and cultural insights throughout the instructional cycles. Prior to participation, all students provided informed consent, and the research received ethical approval from the university's institutional review board.

Planning, implementation, observation, and reflection are the cycles of this research. The planning phase involved a comprehensive needs analysis through multiple data collection methods. Pre-intervention questionnaires with 19 students assessed students' initial multicultural awareness and sociolinguistic competence using a five-point Likert scale ranging from *strongly disagree* to *strongly agree*. Semi-structured interviews with three lecturers revealed pedagogical gaps in existing sociolinguistic instruction, particularly regarding technology integration and multicultural content. Based on this preliminary analysis, a supplementary sociolinguistic module integrating Pro-Tech Learning was developed, combining project-based learning, local studies, practitioner sessions, and digital media tools such as podcasts, video documentaries, and collaborative online platforms. Content validity was established through expert review by a single sociolinguistics specialist and one educational technology expert.

The action phase consisted of structured classroom sessions implementing the Pro-Tech Learning integrated module. Students engaged in small group collaborative projects with three or four students in each group addressing authentic sociolinguistic phenomena such as code-switching patterns, language variation in multicultural contexts, and speech community dynamics in the Nganjuk region. Digital tools facilitated data collection and analysis, including mobile applications for recording naturally occurring conversations, online collaborative platforms for group discussions, and multimedia presentations to support project outcomes and enhance multicultural awareness (Dorfsman, 2018). Therefore, this research utilized practitioner collaborators who contributed through guest lectures in video learning and provided authentic case study materials reflecting local multicultural practices.

Systematic observation employed multiple data collection techniques to capture learning processes and outcomes. Structured classroom observation sheets documented student engagement, collaborative interactions, and critical thinking demonstrations during Pro-Tech Learning activities. The student assessment rubric described students' ability to connect sociolinguistic theory concepts with real life, which impacted increasing students' understanding of multicultural aspects. Student projects, student activities, student attendance lists, and student questionnaire results from preliminary studies, cycle 1, and cycle 2 served as important information in learning. At the implementation stage, authentic materials required students to communicate directly with practitioners, facilitating metacognitive awareness and enabling students to articulate their evolving understanding of multicultural sociolinguistic phenomena.

The reflection phase involved collaborative analysis of collected data among researchers, students, and practitioner collaborators. Post-intervention questionnaires measured changes in multicultural awareness and sociolinguistic competence using identical instruments from the pre-intervention phase. Focus group discussions in six groups explored students' perceptions of Pro-Tech Learning effectiveness and multicultural learning experiences. Statistical analysis employed paired samples t-tests to examine significant differences between pre- and post-intervention scores. Qualitative data from observations, interviews, and reflections underwent thematic analysis following Gehrke et al. (2021). Four-phase approach to identify recurring patterns and emerging themes related to multicultural awareness development.



Data analysis in this study utilized descriptive quantitative methods to ensure a comprehensive understanding of Pro-Tech Learning in the learning process. The data were collected from the assessment of student and lecturer questionnaires, spanning the preliminary study, Cycle I, and Cycle II, to measure the positive implementation of multicultural awareness and student competence in sociolinguistic lessons (Beg et al., 2018). Pre- and post-intervention questionnaire results were analyzed using paired-sample t-tests to measure significant differences in students' multicultural awareness and sociolinguistic competence (Song et al., 2024). The implementation of Pro-Tech Learning in the learning process facilitated real-time data collection and analysis by researchers, enabling feedback and instructional adjustments in each cycle. This was designed to ensure students' needs for continuous development in learning and multicultural understanding throughout the learning process.

RESULTS AND DISCUSSION

The Advantages of Pro-Tech Learning in a Sociolinguistic Approach Through Practitioners' Involvement for Multicultural Awareness

Before the intervention, diagnostic assessments revealed that students exhibited low levels of multicultural awareness and sociolinguistic competence. Only 40% of students actively participated in classroom activities, while 73.68% demonstrated weak understanding of sociolinguistic theory, and 52.63% showed heavy dependence on textbooks with minimal technology utilization. These conditions indicated that the conventional learning method had not yet supported the development of students' multicultural and digital competencies effectively.

To address these issues, the Pro-Tech Learning framework was introduced to merge technological tools with sociolinguistic principles, aiming to develop students' conceptual and intercultural skills (Prahani et al., 2022). In Cycle I, this integration raised participation from 40% to 65%, reflecting a moderate improvement in engagement and curiosity toward multicultural content, although 35% of students remain relatively passive.

After pedagogical refinement in Cycle II, which applied Project-Based Learning (PjBL) and direct collaboration with practitioners, students' engagement significantly increased to 85%. Technology integration reached 94.74, while conceptual mastery and case-based learning both improved by 52.63% (Hidaayatullaah et al., 2020). Moreover, the tolerance of values rose from 36.84% in pre-cycle to 84.21% in Cycle II, and use of local sociolinguistic examples increased from 54.89% to 89.47%, indicating a 34.58% total increase. These findings confirm that Pro-Tech Learning significantly enhanced students' motivation, digital literacy, sociolinguistic competence, and multicultural awareness. The implementation results could be described in table 1 below.

Table 1. Result of pro-tech learning cycle

Performance Indicator	Pre-Cycle	Cycle I	Cycle II	Total Improvement	Final Status
Sociolinguistic Concept Understanding	26.32%	45%	78.95%	+52.63%	Mastery Achieved
Case-Based Learning	36.84%	57%	89.47%	+52.63%	Excellent
Interest Values	36.84%	52%	84.21%	+47.37%	Excellent
Development					
Student Engagement	40%	65%	85%	+45%	Excellent
Technology Integration	57.89%	70%	94.74%	36.85%	Optimal
Multicultural Awareness	47.37%	60%	84.21%	36.84%	Excellent

Performance Indicator		Pre-Cycle	Cycle I	Cycle II	Total Improvement	Final Status
Local Utilization	Example	78.95%	84%	94.74%	15.79%	Optimal
Linguistic Recognition	Diversity	100%	100%	100%	Maintained	Perfect
Overall Performance	Average	54.89%	69.17%	89.47%	+34.58%	Outstanding

The findings across the three stages of intervention indicate clear progressive improvements in multiple dimensions of multicultural competence and sociolinguistic learning. Multicultural awareness increased from 47.37% in the pre-cycle to 60% in Cycle I and reached 84.21% in Cycle II, indicating a progressive shift from limited cultural sensitivity to strong intercultural competence. This improvement confirms that Pro-Tech Learning effectively facilitates students' understanding of cultural diversity through experiential and reflective learning, as supported by Kampermann et al. (2021), who emphasize that strong learning outcomes originate from well-designed instructional frameworks. Technology-enhanced learning showed substantial quantitative growth, with technology integration increasing from 57.89% in the pre-cycle to 94.74% in cycle II. This result demonstrates that students not only adopted digital tools but also utilized them meaningfully for sociolinguistic research, data analysis, and multimedia presentations. This finding strengthens the argument that technology acts as a powerful catalyst for student-centered sociolinguistic inquiry.

Equally important was the transformation in collaborative learning culture. In the pre-cycle stage, students predominantly engaged in individual and passive forms of learning. In Cycle I, I introduced collaboration through group activities and activities focused on inside the class, while Cycle II achieved near-universal student participation (85%) in group-based research projects. Students validated textbook knowledge through real-world confirmation with practitioners, allowing them to directly connect theory and social reality. This condition created a learning environment that was highly conducive to multicultural exploration and inclusive interaction. Another notable improvement was observed in students' tolerance and cultural sensitivity, which rose from 36.84% in the pre-cycle to 84.21% in Cycle II. By engaging with practitioners and authentic sociolinguistic cases, students were no longer passive recipients of cultural knowledge but active interpreters of multicultural realities. This result marks the students' proficiency in reflecting cultural diversity and articulating values of tolerance as evident, marking a transformational outcome in alignment with the sociolinguistic objectives.

The Challenges of Implementing Pro-Tech Learning into a Sociolinguistic Approach Through Practitioners' Involvement for Multicultural Awareness

The implementation of Pro-Tech Learning within a sociolinguistic framework presented several practical challenges, particularly in the preparatory phase. Since the model emphasizes a student-centered approach, both students and lecturers shared equal responsibility in designing the learning process. Students worked in small groups, each focusing on a unique sociolinguistic issue that required real-world observation with practitioners. The process took about two weeks to complete before their presentations. This stage also revealed early challenges, as only 40% of students initially demonstrated active engagement, reflecting their limited readiness for practitioner-based tasks.

This preparation allowed students to collect authentic data, conduct interviews or podcasts, and develop their findings into formal research papers. The lecturer then evaluated these papers to maintain academic quality and coherence across all submissions. The process not only strengthened students' research and communication skills but also implicitly nurtured their sociolinguistic competence through real-world engagement and reflective collaboration.

Findings from Cycle I later confirmed this improvement, with participation increasing to 65% and students beginning to demonstrate stronger curiosity toward multicultural issues.

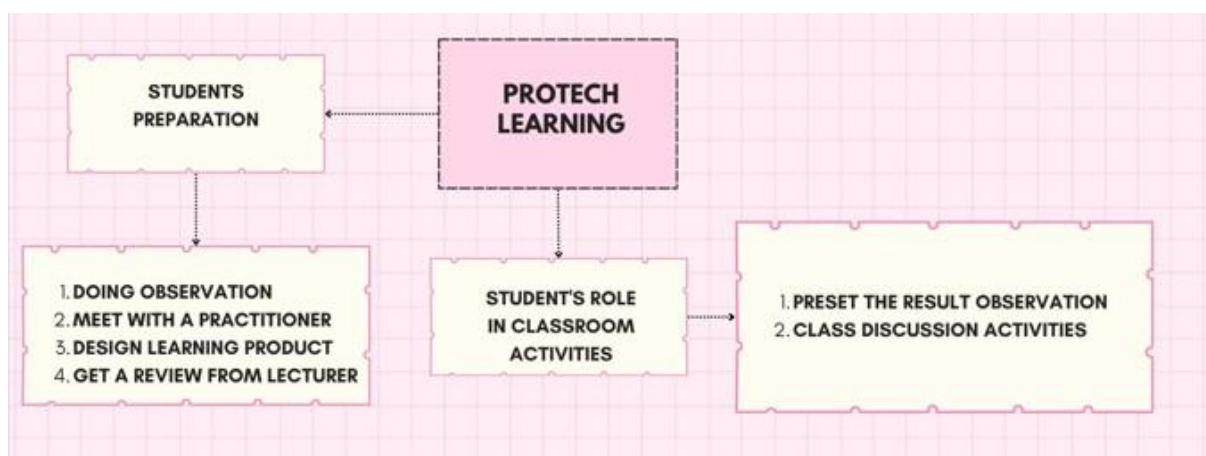


Figure 3. Pro-Tech Learning Challenge in Multicultural Awareness

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It required around two weeks of preparation before the final presentation, allowing students to collect authentic data, conduct interviews or podcasts, and develop their findings into formal research papers. The lecturer then evaluated these papers to maintain academic quality and coherence across all submissions. The process not only strengthened students' research and communication skills but also implicitly nurtured their sociolinguistic competence through real-world engagement and reflective collaboration. By Cycle II, students showed substantial improvement, with 85% demonstrating active engagement and 78.95% achieving mastery in sociolinguistic concept understanding.

Another major challenge lay in maintaining students' consistency and motivation throughout the observation and data synthesis stages. Since each group handled distinct materials and collaborated with different practitioners, coordination became a key issue. In the Pro-Tech Learning implementation, several students faced difficulties in maintaining effective communication with practitioners and linking their field observations to the theoretical foundations of their sociolinguistics coursework. These challenges were reflected in Cycle I outcomes, where only 57.89% of students effectively integrated technology and practitioner feedback into their analyses.

These obstacles proved beneficial, as the practitioners motivated students to explore genuine perspectives on language use across different cultural contexts. Through the feedback and discussion cycles, their analytical thinking improved, and they became more sensitive to the multicultural aspects reflected in patterns of language variation. This progression is

consistent with the improvement of students' multicultural awareness, which increased from 47.37% in the pre-cycle to 84.21% in Cycle II. The classroom implementation of Pro-Tech Learning also required strategic facilitation from the lecturer to sustain active participation. Each class began with a lecturer-led introduction presenting real-life sociolinguistic cases, followed by group presentations. Student participation during these sessions was promoted through questioning, peer exchange, and collaborative dialogue, which directly affected their assessment outcomes. This interactive structure contributed to the rise in collaborative learning performance, improving from 40% participation in the pre-cycle to 85% in Cycle II.

The interactive sessions fostered collaboration and inclusivity, supported by immediate feedback to strengthen understanding and correct misconceptions. Each session concluded with direct feedback to help students consolidate their understanding and resolve conceptual difficulties. These strengths, ensuring balanced participation across all groups, remained a persistent challenge, emphasizing the need for continuous improvement in facilitation strategies and time management within the Pro-Tech Learning framework. Despite these challenges, overall student performance increased significantly from 54.89% in the pre-cycle to 89.47% by Cycle II, demonstrating the effectiveness of the model.

The Student's Motivation in Implementing Pro-Tech Learning into a Sociolinguistic Approach Through Practitioners' Involvement for Multicultural Awareness

The paired sample t-test results revealed a statistically significant improvement in students' motivation and learning performance between Cycle I and Cycle II. This occurred after the implementation of the Pro-Tech Learning framework. The data show meaningful gains across nearly all indicators. Integrating practitioner involvement with technology improved students' multicultural awareness and sociolinguistic skills. The students' understanding of sociolinguistic theory increased from 45% to 78.95% ($t = 7.84$, $p < 0.001$), and the students' interest based on Pro-Tech Learning increased from 57% to 89.47% ($t = 7.12$, $p < 0.001$). Tolerance values rose from 52% to 84.21% ($t = 6.91$, $p < 0.001$), and engagement reached 85% ($t = 5.24$, $p < 0.001$). These improvements indicate that Pro-Tech Learning successfully enhanced students' intrinsic motivation, particularly in exploring multicultural issues through authentic and technology-supported activities. The approach bridges the theoretical and practical dimensions of sociolinguistic education.

Table 2. Result students' motivation in pro-tech learning

Performance Indicator		cycle 1	Cycle II	mean	t-value	df	p-value
Sociolinguistic Understanding	Concept	45	78.95	33,95	7,84	18	0.000
Case-Based Learning Interest		57	89.47	32,47	7,12	18	0.000
Tolerance Values Development		52	84.21	32,21	6,91	18	0.000
Student Engagement		65	85	20	5,24	18	0.000
Technology Integration		70	94.74	24,74	5,98	18	
Multicultural Awareness		60	84.21	24,21	5,87	18	0.000
Local Example Utilization		84	94.74	10,74	3,72	18	0.001
Linguistic Diversity Recognition		100	100	0		18	
Overall Average Performance		69.17	89.47	20,30	8,15	18	0.000

Further analysis revealed that technology integration increased substantially from 70% to 94.74% ($t = 5.98$, $p < 0.001$), indicating the effective adoption of digital tools for research, presentation, and collaboration. Students also exhibited higher multicultural awareness, improving from 60% to 84.21% ($t = 5.87$, $p < 0.001$), and enhanced utilization of local examples from 84% to 94.74% ($t = 3.72$, $p = 0.001$). Meanwhile, linguistic diversity recognition remained consistently high at 100% in both cycles, showing sustained awareness in this aspect. These findings demonstrate that students became increasingly confident in applying sociolinguistic

concepts to real-world multicultural contexts and more adept at identifying language variation across communities.

Overall, the mean performance rose from 69.17% to 89.47%, with a mean difference of 20.30% ($t = 8.15$, $p < 0.001$). This substantial increase confirms that Pro-Tech Learning not only improved cognitive mastery but also strengthened students' motivation, digital literacy, and cultural sensitivity across the two cycles. The combination of practitioner involvement, technology-based exploration, and project-driven activities proved effective in fostering deeper engagement and sustained motivation throughout the learning process.

Discussion

The systematic implementation of the Pro-Tech Learning model within sociolinguistic material significantly improved the students' multicultural awareness, technology integration, and collaborative learning engagement. The two-cycle design of this classroom action research allowed for interactive strategies, ensuring that the challenges identified in Cycle I were effectively addressed in Cycle II. The findings showed notable improvement in students' participation, conceptual understanding, and tolerance values, as reflected in the increase of overall performance from 69.17% in Cycle I to 89.47% in Cycle II. At the end of the research, the students showed significant improvement in their sociolinguistic academic skills while simultaneously strengthening their multicultural competencies.

Beyond qualitative improvement, these findings reflect a deeper pedagogical shift—from teacher-centered learning to technology-empowered, student-centered engagement. This shift aligns with several key findings that contributed to this research outcome. Firstly, the progressive integration of technology in the learning process has a positive effect on education, which is supported by this study's results showing that technology integration increased from 70% to 94.74% between cycles. The similar result in Pro-Tech Learning enables students and lecturers to adapt gradually, guiding students from the limitations of digital platforms toward maximizing their creativity in using them.

Second, project-based collaborative learning with practitioners fostered authentic cultural exploration, ensuring students' activity and meaningful engagement while addressing the subject's challenge (Anggraeni et al., 2023; Fauzan & Saparuddin, 2023). This aligns with the observed increase in student engagement from 65% to 85% and the sharp rise in multicultural awareness from 60% to 84.21%. Incorporating the local cultural context of Nganjuk, particularly its unique sociolinguistic practices, significantly enhanced the relevance and practicality of classroom learning activities. Moreover, the reflective process embedded in each Pro-Tech Learning cycle ensured continuous pedagogical refinement, thereby reinforcing the overall effectiveness and sustainability of the intervention. The success of Pro-Tech Learning confirms that students develop stronger analytical and multicultural competencies when actively involved in contextual inquiry and collaboration with practitioners.

These results resonate with previous studies indicating that the theoretical framework of Pro-Tech Learning particularly emphasizes the intersection between technology integration, collaborative learning, and multicultural awareness development in English language education, especially in the sociolinguistic subject. The significant improvement in sociolinguistic conceptual mastery from 45% to 78.95% provides empirical evidence supporting these theoretical claims. This study advances prior work by emphasizing practitioner collaboration as a mediating factor that contextualizes sociolinguistic theory into real-world experience, unlike previous research that focused primarily on theoretical instruction (Mandarani & Munir, 2021). Moreover, the outcomes of this research underline the role of classroom action research as the methodological framework for implementing and evaluating pedagogical innovations in cultural settings. The current study demonstrates how Pro-Tech Learning bridges theory and practice through digital tools, thus promoting authentic multicultural engagement.

In terms of theory, the findings reinforce sociocultural learning principles, which posit that learning is most effective when situated in social interaction and cultural contexts (Lantolf et al., 2024). The increase in students' ability to apply local examples (from 84% to 94.74%) and their consistent 100% recognition of linguistic diversity reflect strong alignment with these sociocultural learning principles. Students' increased tolerance and cultural sensitivity mirror the framework of intercultural communicative competence, suggesting that Pro-Tech Learning enhances not only linguistic awareness but also empathy, adaptability, and openness—key elements of intercultural education.

Comparatively, this study's outcomes align with Song et al. (2024), who found that the combination of Project-Based Learning (PBL) and digital media enhances both cognitive and affective domains in language learning. However, the present study contributes a unique perspective by demonstrating significant gains across both cognitive and intercultural dimensions through the integration of practitioner-led activities, an approach not commonly applied in Indonesian sociolinguistic contexts. Yet, the novelty of this study lies in its integrative approach embedding practitioner-led collaboration within a digital sociolinguistic framework, which has not been widely applied in Indonesian sociolinguistic contexts.

In summary, this study's integration of Pro-Tech Learning into sociolinguistic approaches offers a transformative pathway to enhance multicultural competence in multilingual educational contexts in Nganjuk. This approach not only strengthens students' academic understanding of sociolinguistics but also prepares them with the intercultural awareness and tolerance necessary for navigating contemporary globalized societies, both now and in the future. The strong quantitative outcomes across both cycles reinforce the model's effectiveness, confirming its potential to be replicated in similar educational settings.

CONCLUSION

This classroom action research successfully describes that integrating Pro-Tech Learning in the sociolinguistic subject is an effective strategy for enhancing multicultural awareness in Indonesian higher education contexts. The systematic improvement of this research is documented from a 54.89% baseline to 89.47% as the final achievement, providing compelling evidence of the methodology's transformative potential for English language education.

The research contributes both theoretical understanding and practical application of multicultural education as an effective framework for pedagogical innovation. The findings support continued investment in technology-enhanced collaborative learning approaches with authentic cultural investigation experiences for future research.

Most importantly, this research demonstrates that pedagogical innovation, grounded in systematic reflection and evidence-based practice, can achieve exceptional educational outcomes while respecting local cultural contexts in students' social lives. The success of Pro-Tech Learning in fostering both sociolinguistic competence and multicultural awareness suggests that similar integrated approaches could be implemented in education across diverse academic disciplines and cultural settings.

Last, the implications of this study extend beyond immediate educational contexts to inform broader discussions about effective intercultural education in an increasingly connected global society. By successfully bridging local cultural knowledge with international educational standards, this research provides a model for developing culturally responsive pedagogical approaches that prepare students for multicultural professional and social environments in their lives.

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