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Research Article

Technology-Assisted Pronunciation: Using ELSA Speak Application To Master –Ed Endings

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Abstract
This study investigates the use of the ELSA Speak application to enhance the pronunciation of English –ed endings among seventh-grade students at SMPN 1 Candipuro. Aimed at overcoming common pronunciation issues with the /t/, /d/, and /ɪd/ sounds, this Classroom Action Research (CAR) involved 32 students in two cycles. Data were collected through pre-tests, post-tests, and classroom observations. Results showed significant improvements in student pronunciation, with average scores increasing from 56.25% (pre-test) to 72.81% (Cycle 1) and 83.28% (Cycle 2). Additionally, students demonstrated increased motivation and confidence in their speaking abilities. The study highlights the effectiveness of ELSA Speak in providing targeted, real-time feedback to address specific pronunciation challenges, particularly for non-native learners. It underscores the potential of digital tools in English language teaching, especially in pronunciation training. Based on the findings, ELSA Speak is recommended as a useful aid for teaching English pronunciation, with particular focus on overcoming the difficulties students face with –ed endings.

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Introduction

Pronunciation is a fundamental aspect of English learning, yet it often receives less attention compared to grammar and vocabulary in classroom practices (Harmer, 2007; Roach, 1991; Gilakjani, 2017). For non-native learners, including Indonesian students, mastering pronunciation is crucial not only for comprehensibility but also for building communicative competence (Morley, 1991). However, many students still face persistent challenges in producing correct sounds, stresses, and intonation patterns, particularly when dealing with English phonological features that do not exist in their first language (Sholeh, 2015) .

Indonesian students often encounter difficulties in learning English pronunciation, primarily due to the influence of their native language. When acquiring a second language, the first language frequently interferes with the target language, transferring phonological habits into the new system (Avery & Ehrlich, 1992; Celce-Murcia et al., 2010). This interference can affect several aspects of pronunciation, including the articulation of individual sounds, stress, intonation, and rhythm. For instance, the absence of certain phonemes in Indonesian, such as the interdental fricative [θ], leads to difficulties in pronouncing words like think or thought (Hakim, 2012). Similarly, Indonesian learners struggle with English consonant clusters, particularly in final positions, as Indonesian does not allow such structures (Kurniawan, 2016).

The phonological system of Indonesian differs significantly from that of English, and this often results in systematic errors. For instance, Indonesian lacks certain sounds that are common in English, such as the interdental fricative [θ], which leads learners to substitute it with [t] or [s] when pronouncing words like think or thought (Setiawan, 2020). In addition, consonant clusters pose further difficulties. While English allows both initial clusters (e.g., [fl] in fly) and final clusters (e.g., [pt] in stopped), Indonesian phonology permits only a limited number of initial clusters (e.g., [pr] in pramuka) and does not allow final consonant clusters. Consequently, Indonesian learners often omit, simplify, or insert vowels in cluster environments, which negatively affects their intelligibility (Gilakjani, 2016).

Given these differences, Indonesian EFL learners require explicit instruction and extensive practice to overcome first language interference. Research has shown that targeted pronunciation training and the use of technological tools, such as speech recognition applications, can help learners improve their accuracy and confidence in English pronunciation (Anggraini, 2022).

One of the most common difficulties among Indonesian learners is pronouncing the –ed ending in regular verbs. Preliminary findings at SMPN 1 Candipuro revealed that 75% of students struggled with this feature, often mispronouncing all –ed endings as /ɪd/. A diagnostic test also showed an average accuracy of only 56.25%, with frequent errors in differentiating between the /t/, /d/, and /ɪd/ sounds. This highlights a specific problem that requires targeted pedagogical intervention. The findings from the question 'Do you have difficulty pronouncing English words ending in -ed?' (n=32) are visualized below:

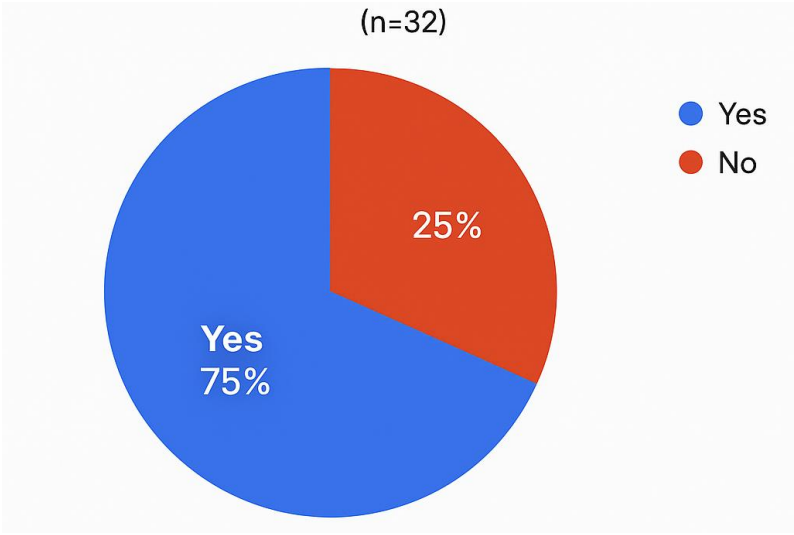

Figure 1. Students' Opinion Regarding Difficulties in Pronouncing English Word With Ending -ed

As can be seen from the statement above, the data shows that 75% of students have difficulty pronouncing English words with – ed ending, while students who do not have difficulty pronouncing English words with –ed ending are 25%. It can be concluded that students still have difficulty mastering the pronunciation of the -ed ending.

In the teaching process, students play a central role in determining learning outcomes, as they are the primary subjects of learning activities. Their achievement is largely influenced by motivation, willingness to learn, active participation, and the capacity to receive and process instructional materials. However, student-related factors are not the only determinants of success. Learning

outcomes are also shaped by the quality of teaching, curriculum design, learning environment, availability of resources, and individual differences such as learning styles and preferences.

Teachers likewise hold a significant responsibility in shaping students' learning progress, particularly in pronunciation instruction. Their role extends beyond delivering material to include motivating learners, facilitating practice, and serving as pronunciation models. Effective pronunciation teaching requires teachers to design appropriate learning activities, select suitable materials, monitor progress, and provide constructive feedback (Anggraini, 2022; Dalton, 1994; Dziubalska-Kołaczyk, 2008).Yet, when teachers face excessive workloads, they may be unable to devote sufficient time and energy to the teaching process. This often results in less effective learning experiences and limited opportunities for students to receive the individualized support and feedback essential for developing accurate pronunciation mastery.

Speech recognition technology has increasingly been recognized as an effective tool to help improve and refine English pronunciation (Hongmei Yang and Xiaoli Wang, 2020). ELSA Speak differs from many other language learning applications that focus primarily on vocabulary and grammar, as it specifically incorporates speech recognition technology designed to provide immediate, individualized feedback on learners' pronunciation. With this feature, the application is reported to detect more than 95 percent of user pronunciation errors and subsequently provide corrective feedback to facilitate improvement (Van Dinh, Nguyen, and Tuong Nguyen, 2022).This function distinguishes ELSA from other English language learning applications, as it not only identifies errors but also supplies actionable suggestions for refinement. Furthermore, ELSA Speak offers learners more than 1,200 lessons and over 60 topics that encompass a wide range of communicative contexts, enabling practice of both words and phrases relevant to learners' needs(Anggraini, 2022). Given these advantages, the present research proposes the integration of ELSA Speak as an instructional medium to support the teaching of English pronunciation, with a particular focus on the accurate production of the inflectional ending –ed.

Previous studies emphasize the importance of technology-assisted learning for pronunciation improvement (Faizal & Alimudin, 2018; Rinaepi et al., 2022). While many applications focus on vocabulary and grammar, limited research has explored the role of intelligent speech recognition tools in addressing segmental pronunciation difficulties such as the –ed ending. ELSA Speak, an AI-powered application, offers individualized feedback and has shown effectiveness in improving learners' pronunciation in broader contexts, but its potential in addressing this particular issue has not been sufficiently examined.

Given these gaps, the present study investigates the implementation of ELSA Speak as a learning medium to overcome students' pronunciation errors of the –ed ending. This research is urgent because effective pronunciation instruction directly supports students' communicative competence, boosts their confidence in speaking, and contributes to their academic and professional readiness in a globalized era. Therefore this study identifies students' difficulties in pronouncing the –ed ending in implementing ELSA Speak as a digital pronunciation tool. This research investigated the improvement of the students' pronunciation of ending –ed at the seventh grade through the implement of the ELSA Speak Application, focusing on the accurate pronunciation of –ed endings in terms of sounds (/d/, /t/, /ɪd/). The findings are expected to contribute both theoretically and practically: theoretically, by enriching the literature on pronunciation pedagogy in EFL contexts; and

practically, by providing teachers with an innovative and accessible medium to enhance students' learning outcomes.

Methods

This study used a Classroom Action Research (CAR) design following the model proposed by Kemmis and McTaggart (Creswell, 2012; Burns, 2021; Kemmis, S., & McTaggart, R., 1988), which consists of four stages: planning, action, observation, and reflection. The research was conducted in two cycles, with each cycle comprising two meetings. The second cycle was designed as a continuation and improvement of the first, addressing issues identified during the initial cycle. The main objective of applying CAR was to improve the learning process and to strengthen the professionalism of teachers in classroom practice. By adopting this cyclical approach, the study sought to create a systematic process of evaluation and refinement to enhance the overall quality of education.

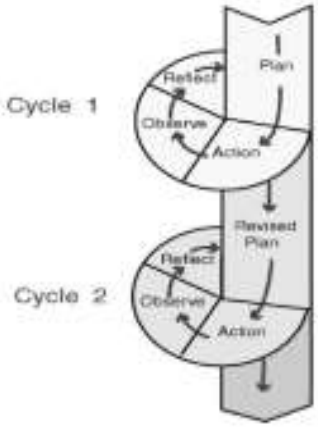

Figure 1. Action Research model according to Kemmis and Mc Taggart

Based on the description of action research by Kemmis and McTaggart, action research is a cyclical process consisting of planning, action, observation, and reflection, carried out in more than one cycle as needed. The number of cycles depends on the context and purpose of the research, and the process may be concluded once the targeted improvement—in this case, students' pronunciation—has been achieved (Burns, 2010). In line with the collaborative principle of Classroom Action Research, the researcher conducted the study in partnership with the English teacher of class VII at SMPN 1 Candipuro to design, implement, and evaluate each stage of the cycles.

Results and Discussion

Findings

This section presents the findings in the order of the study's objectives and organizes the evidence into three domains: (1) language performance, (2) classroom participation and discourse processes, and (3) moderation-related attitudes and behaviors. Results are reported descriptively and supported by tables and figures following APA conventions. Unless otherwise stated, Cycle 1 (C1) refers to the first action cycle and Cycle 2 (C2) to the subsequent cycle.

Language Performance

Student outcomes in reading comprehension, translation accuracy, and argumentative response in Arabic were assessed across two CAR cycles. Results are summarized in terms of mean scores, variability, and mastery attainment relative to predetermined benchmarks.

Table 1. Language performance by cycle (N=32 per cycle)

Metric	Cycle 1 (M)	Cycle 1 (SD)	Cycle 2 (M)	Cycle 2 (SD)	Mastery threshold	Cycle 1 % ≥ threshold	Cycle 2 % ≥ threshold
Reading comprehension	72.4	8.9	82.1	6.9	75	56.3	87.5
Translation accuracy	68.1	9.7	77.8	7.2	75	43.8	81.3
Argumentative response	66.7	10.2	76.5	8.4	70	40.6	84.4

As shown, all indicators demonstrated substantial gains from Cycle 1 to Cycle 2. Reading comprehension increased from M = 72.4 (SD = 8.9) to M = 82.1 (SD = 6.9), with 87.5% of students meeting the mastery threshold. Translation accuracy rose from M = 68.1 (SD = 9.7) to M = 77.8 (SD = 7.2), while argumentative response improved from M = 66.7 (SD = 10.2) to M = 76.5 (SD = 8.4), with more than 80% of students surpassing benchmarks in both domains. Standard deviations decreased across measures, suggesting enhanced consistency among learners. Collectively, these results highlight the effectiveness of iterative PBL-CAR cycles in fostering both linguistic proficiency and higher-order reasoning, particularly in translation and argumentative tasks that align closely with the enactment of moderation values. Figure 1 illustrates these improvements, with Cycle 2 scores consistently exceeding those of Cycle 1.

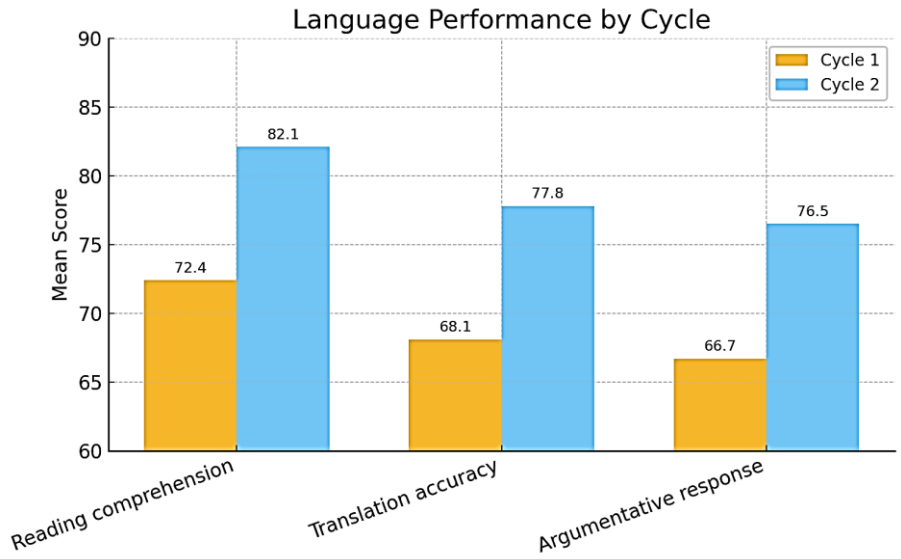

Figure 1. Language performance by cycle.

Inter-rater reliability analysis confirmed that performance ratings were consistent across evaluators. For translation accuracy, the ICC was 0.86 (95% CI = 0.74–0.93), indicating good-to-excellent agreement, while argumentative response yielded an ICC of 0.82 (95% CI = 0.69–0.91),

reflecting good agreement. These results confirm that the analytic rubrics ensured stable and trustworthy evaluations, minimizing rater subjectivity.

Table 2. Inter-rater reliability (ICC) summary for rated performance tasks

Rated metric	Raters	ICC (95% CI)	Model
Translation accuracy	2	0.86 (0.74–0.93)	Two-way mixed, absolute agreement
Argumentative response	2	0.82 (0.69–0.91)	Two-way mixed, absolute agreement

As shown in Table 2, ICC values for translation accuracy (0.86) and argumentative response (0.82) fall within the good-to-excellent range, confirming that the rubric produced consistent scores across raters.

Participation and Discourse Processes

Observation checklists recorded indicators of participation and discourse quality during collaborative tasks. The following table summarizes the frequency and percentage of each indicator across two CAR cycles.

Table 3. Observation indicators of discourse and moderation by cycle

Indicator	Total observed events (per cycle)	Cycle 1 count	Cycle 1 %	Cycle 2 count	Cycle 2 %
Turn-taking adherence	160	94	58.8	121	75.6
Evidence-backed statements	160	76	47.5	103	64.4
Respectful disagreement	160	71	44.4	97	60.6
De-escalation moves	160	39	24.4	68	42.5

As shown in Table 3 and Figure 2, all four indicators increased substantially from Cycle 1 to Cycle 2. The largest relative gains were observed in de-escalation moves (+18.1 percentage points), indicating stronger adoption of non-violent conflict resolution strategies. These patterns suggest that iterative PBL-CAR cycles not only improved language performance but also fostered moderation-aligned discourse practices.

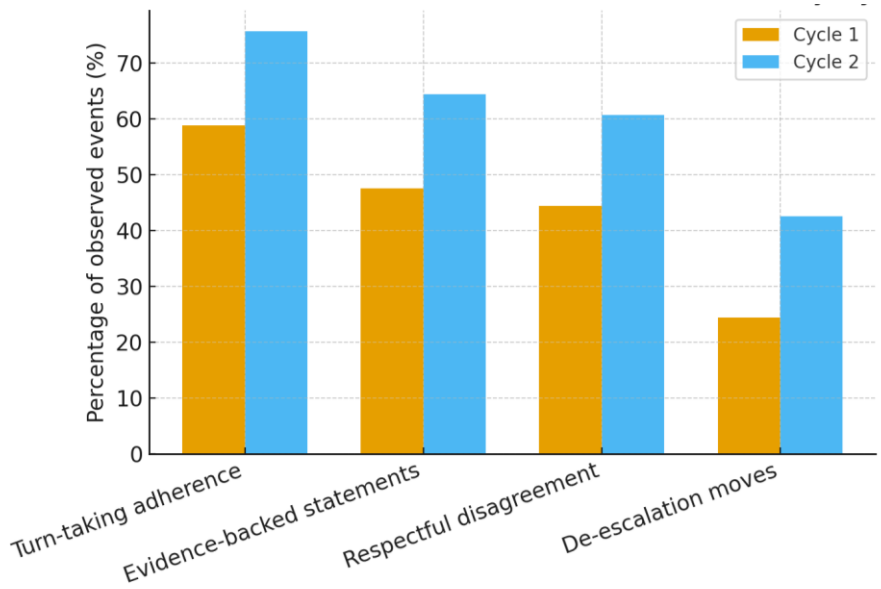

Figure 2. Observed discourse and moderation indicators by cycle.

Figure 2 illustrated the relative frequency of discourse and moderation indicators across two CAR cycles. The bars showed consistent increases from Cycle 1 to Cycle 2 for all four behaviors, confirming the quantitative trend reported in Table 3. The most notable gain was observed in de-escalation moves, which rose by 18.1 percentage points, suggesting that students became more adept at managing conflict through non-violent strategies. Respectful disagreement and evidence-backed statements also increased substantially, reflecting stronger engagement in dialogic and reasoned argumentation. Turn-taking adherence reached the highest overall percentage in Cycle 2 (75.6%), indicating that collaborative interaction norms were more consistently followed. Taken together, these improvements suggested that iterative PBL-CAR cycles not only enhanced linguistic participation but also fostered moderation-aligned discourse practices.

In addition to event-level frequencies, qualitative field notes documented excerpts that exemplified how students enacted moderation-aligned discourse practices during collaborative tasks. Selected anonymized instances are presented in Table 4 to illustrate typical utterances corresponding to each coding category, shown verbatim in Arabic alongside their English translations without analytic commentary.

Table 4. Qualitative excerpts of discourse and moderation indicators

Indicator	Excerpt (Arabic)	English Translation
Respectful disagreement	أَنا أَفْهَمُ وُجْهَ نَظَرِكَ، لَكِنَّ الدَّلِيلَ فِي الفَقْرَةِ الثَّانِيَةِ يُشِيرُ إِلَى أَنَّ العَدَالَةَ تَشْمَلُ حِمَايَةَ الأَقَلِّيَّةِ أَيْضًا	"I understand your point of view, but the evidence in the second paragraph indicates that justice also includes protecting minorities."
Evidence-backed statement	فِي النَّصِّ، كَلِمَةُ «القِسْطِ» تَكَرَّرَتْ ثَلَاثَ مَرَّاتٍ لِتَأْكِيدِ مَبْدَإِ التَّوَازُنِ، لِذَلِكَ أُقْتَرِحُ هَذَا الحَلَّ	"In the text, the word *al-qist* is repeated three times to emphasize the principle of balance; therefore, I propose this solution."
De-escalation move	لِنُؤَجِّلْ هَذَا الجُزْءَ المُثِيرَ لِلْجَدَلِ وَنَبْدَأْ بِالنِّقَاطِ الَّتِي نَتَّفِقُ عَلَيْهَا	"Let us postpone this controversial part and start with the points we agree on."

Turn-taking adherence	سَأُنْهِي جُمْلَتِي الآنَ، ثُمَّ دَوْرُكَ لِتَقْدِيمِ الدَّلِيلِ مِنَ النَّصِّ	"I will finish my sentence now, then it is your turn to present the evidence from the text."

As shown in the excerpts, students not only adhered to turn-taking and expressed respectful disagreement but also increasingly grounded their arguments in textual evidence. These qualitative instances supported the quantitative trend of improved moderation-oriented discourse observed across cycles.

Moderation-related attitudes and behaviors

A brief attitude questionnaire measured three subscales aligned with the moderation framework tolerance, balanced reasoning, and non-violent resolution using a 5-point Likert scale. Descriptive statistics by cycle are presented below.

Table 5. Moderation attitude scale by cycle

Subscale	Cycle 1 (M)	Cycle 1 (SD)	Cycle 2 (M)	Cycle 2 (SD)
Tolerance	3.62	0.51	3.94	0.49
Balanced reasoning	3.47	0.56	3.83	0.53
Non-violent resolution	3.38	0.58	3.76	0.55

As shown in Table 3, tolerance increased from M = 3.62 (SD = 0.51) in Cycle 1 to M = 3.94 (SD = 0.49) in Cycle 2. Balanced reasoning rose from M = 3.47 (SD = 0.56) to M = 3.83 (SD = 0.53), and non-violent resolution from M = 3.38 (SD = 0.58) to M = 3.76 (SD = 0.55). These gains indicated consistent cross-cycle improvement in self-reported moderation-related attitudes.

Observation-based behavioral indicators related to moderation were recorded independently of self-report responses. Field notes also documented spontaneous role assignments that emerged during group tasks (e.g., emergent peer mediators), though these were reported descriptively without interpretive commentary.

Taken together, the findings consistently demonstrated cross-cycle improvements across all domains. For Objective 1 (language performance), descriptive statistics from test-based indicators (Table 1; Figure 1) showed higher means in Cycle 2 compared with Cycle 1, along with an increased proportion of students achieving mastery across reading comprehension, translation accuracy, and argumentative response.

For Objective 2 (moderation-related dispositions and behaviors), event-level observation percentages (Table 2; Figure 2) increased in Cycle 2 across all four categories turn-taking adherence, evidence-backed statements, respectful disagreement, and de-escalation moves. Correspondingly, self-reported attitudes (Table 3) reflected higher means in Cycle 2 for tolerance, balanced reasoning, and non-violent resolution. Representative excerpts illustrated the enactment of these behaviors in authentic classroom discourse.

For Objective 3 (design revision through CAR reflection), cycle records noted three key modifications implemented between cycles: (1) clarification of problem contexts in the Arabic texts (e.g., making stakeholder roles explicit in prompts), (2) additional linguistic scaffolds (e.g., sentence starters for agreement/disagreement and textual evidence references), and (3) recalibration of analytic rubrics to differentiate Basic–Competent–Advanced levels for both language and moderation indicators. All revisions were logged in action records and updated instructional

materials between cycles. Additional quality checks supported the robustness of instruments and scoring: internal consistency of the moderation attitude scales exceeded 0.70, inter-rater agreement for performance-based tasks was high (Table 4), and member checking confirmed the accuracy of observation summaries and the clarity of revised prompts.

Discussion

This classroom action research demonstrated consistent improvements across language performance, moderation-related behaviors, and attitudes when PBL tasks were infused with religious moderation values. These gains establish a basis for linking iterative CAR design with broader discussions of PBL effectiveness and values-based education.

The present pattern of gains is congruent with recent international syntheses that have consolidated evidence for PBL's effects on academic and dispositional outcomes. A 2025 meta-analytic synthesis in higher education confirmed that PBL yields broad positive effects on achievement and critical thinking across modalities (Erdem et al., 2025). In medical and clinical contexts, umbrella reviews also demonstrated that PBL enhances critical thinking and domain-specific skills (Ge et al., 2025; Su et al., 2025). Meta-analyses and reviews focusing specifically on critical thinking similarly conclude that PBL outperforms traditional instruction on higher-order reasoning indicators *e.g.* a meta-analysis in higher education found a standardized mean difference (SMD) = 0.640 favoring PBL for critical thinking skills an effect relevant to our argumentative response task and the coded behaviors of evidence-backed statements and respectful disagreement (Liu & Pásztor, 2022). In language-learning contexts, recent studies likewise report significant gains in literacy and communicative competence supported by PBL, including in blended and digital environments. Although most syntheses have focused on English-medium or professional education, the underlying mechanisms authentic, ill-structured problems; collaborative inquiry; iterative feedback; and explicit scaffolding for reasoning closely mirror the design features implemented between cycles in the present study (Han, 2025; Orhan, 2025).

The UNESCO (2023) recommendation provides a global framework for embedding tolerance, dialogue, and non-violence in education. Recent studies affirm its relevance for higher education, emphasizing the operationalization of peace, intercultural competence, and values-based learning (Guillén-Yparrea & Ramírez-Montoya, 2023; Kohl et al., 2025; Purwanto et al., 2023). The Recommendation emphasizes intercultural competencies, democratic participation, and human-rights-aligned dispositions as explicit educational outcomes; it also calls for pedagogies that make these outcomes observable in classroom discourse. The increased frequencies we recorded for respectful disagreement and de-escalation moves align with the Recommendation's emphasis on dialogic, non-violent conflict navigation as part of learners' skill sets (Saleh et al., 2025; Villarejo-Carballido et al., 2019). The study's movement from general exhortation to classroom-level operationalization of these dispositions speaks to UNESCO's call for practical, assessable enactment, not merely declarative coverage.

Within Indonesia, scholarship on religious moderation has expanded rapidly, accompanied by efforts to embed moderation within curricula and campus life. Recent empirical work on curriculum development for moderation in Islamic higher education documents program-level designs but also notes uneven implementation when values remain primarily cognitive rather than practiced dialogically in classrooms (Mukhibat et al., 2024). Recent studies in Islamic education argue that

strengthening religious moderation requires pedagogical approaches that extend beyond declarative instruction toward experiential and dialogic learning, enabling students to actively practice fairness, tolerance, and non-violence through structured interaction (Haris et al., 2024). In Arabic-education specifically, recent Indonesian studies report that project/problem-oriented designs improve literacy and student engagement, recommending authentic texts and contextual tasks; however, many interventions are one-shot and lack iterative improvement cycles (Luhulima, 2024; Maziyah et al., 2025).

The present research contributes precisely at this intersection: it aligns with national calls for moderation while answering the local methodological gap by using CAR to iteratively refine PBL materials, scaffolds, and rubrics in a real Arabic course. The documented, mid-course design changes clarifying stakeholder roles in prompts, adding sentence starters for polite agreement/disagreement and for citing textual evidence, and rubric calibration mirror the kinds of "practice-proximal" adjustments suggested in Indonesian policy and scholarship but rarely traced across cycles with behavioral and test-based indicators (Haris et al., 2024; Sudeni et al., 2022).

The study foregrounded moderation not as a purely attitudinal construct but as a set of discourse practices that could be operationalized, scaffolded, and counted in classroom interaction. These practices included acknowledging alternative views before rebuttal (tolerance), weighing competing claims with attention to equity (balanced reasoning), and proposing non-violent compromise (de-escalation). By coding and tracking these practices as event-level indicators during PBL tasks, the study contributed an interactional-pragmatic lens to moderation research, complementing curricular and policy-centric perspectives prevalent in the Indonesian literature. In language pedagogy, the findings reinforced socio-constructivist accounts of PBL, which emphasize the role of authentic tasks and collaborative scaffolds in shaping both cognition and discourse (Afify, 2020; Vygotsky, 1978; Zeng & Ravindran, 2025). Carefully sequenced supports functioned as micro-mediating tools that enabled learners to appropriate both target-language forms and moderation practices an instance of "double appropriation" (Mercer & Littleton, 2007). The CAR framework further illustrated a theory-of-improvement logic, whereby structured reflection on process data (observation logs, mastery rates) informed micro-design shifts that coincided with measurable changes in language performance and moderation-aligned behaviors.

Three actionable implications emerged for Arabic language instructors in Islamic higher education. First, problem framing mattered: specifying stakeholder roles and decision constraints in Arabic case prompts supported both textual evidence use and respectful disagreement, likely by narrowing relevance and reducing ambiguity. Second, linguistic scaffolds needed to be value-aligned: sentence starters for agreement, disagreement, and evidence citation in Arabic provided low-threshold supports that allowed students to "do moderation" while using the target language; these supports could be adapted to proficiency bands and progressively faded. Third, rubrics should integrate dual domains: calibrating analytic rubrics to differentiate levels in both language performance and moderation indicators made expectations transparent and reinforced the inseparability of linguistic form and civic ethos in classroom discourse. Embedding such dual-domain rubrics into assessment handbooks and peer-observation protocols would help ensure that moderation becomes a habitual aspect of instructional design rather than an add-on.

At the policy level, the UNESCO Recommendation on Education for Peace, Human Rights and Sustainable Development provides a global normative anchor for integrating values such as

tolerance, dialogue, and non-violence into everyday teaching and assessment (UNESCO, 2023). The Recommendation emphasizes intercultural competencies, democratic participation, and human-rights-aligned dispositions as explicit educational outcomes, and calls for pedagogies that make these outcomes observable in classroom discourse. The increased frequencies recorded for respectful disagreement and de-escalation moves aligned with this emphasis on dialogic, non-violent conflict navigation as part of learners' skill sets. Within Indonesia, the Ministry of Religious Affairs' *Moderasi Beragama* framework (Mukhibat et al., 2024; Singgih, 2023; Zaluchu et al., 2025). Similarly stresses fairness, tolerance, and anti-violence as educational priorities. The present protocol PBL cases with explicit stakeholder framing, value-aligned linguistic scaffolds, and dual-domain rubrics tracked via CAR offers a replicable "micro-policy" for program leaders: it translates macro-norms into course-level routines with built-in evidence streams (mastery rates, observation tallies, attitude subscales).

Relative to prior studies, this research makes three key contributions. First, it operationalizes moderation as coded discourse practices within Arabic PBL tasks, enabling systematic frequency tracking rather than relying solely on self-reports or policy narratives. Second, it applies an iterative design logic through documented mid-course refinements clarifying problem contexts, enriching linguistic scaffolds, and recalibrating rubrics linking these adjustments to measurable improvements across cycles. Third, it introduces a dual-domain assessment model that integrates language mastery benchmarks with moderation behavior tallies and concise attitude subscales, providing a compact, transferable framework for values-based language instruction in faith-oriented higher education.

The study's limitations include its single-class CAR design without a control group, locally derived mastery thresholds that may constrain generalizability, potential social desirability in self-reported attitudes, and confinement to one institutional context. Replication across institutions and proficiency levels is recommended to validate transferability.

Future research should experimentally compare alternative case framings, examine optimal scaffold fading sequences, explore longitudinal persistence of learning and behavioral gains, and test cross-institutional and cross-cultural applicability of the dual-domain rubric framework.

Overall, this study advances a practice-proximal account of how values-infused PBL in Arabic can be iteratively enhanced through CAR, yielding concurrent improvements in linguistic competence and moderation-oriented classroom interaction. It operationalizes global calls for peace- and rights-based education into concrete, replicable pedagogical routines for Islamic higher education.

Conclusion

This study examined the integration of religious moderation values into Arabic language instruction through a Problem-Based Learning (PBL) model implemented via Classroom Action Research (CAR). Across two iterative cycles, results showed consistent improvements in students' reading comprehension, translation accuracy, and argumentative responses in Arabic, alongside observable increases in moderation-related behaviors such as tolerance, balanced reasoning, and non-violent conflict resolution. The CAR process—encompassing planning, action, observation, and reflection—enabled continuous refinement of PBL materials, linguistic scaffolds, and analytic rubrics. These findings confirm that an iterative, values-infused PBL framework can simultaneously enhance linguistic competence and civic-moral dispositions, demonstrating the pedagogical potential of moderation-oriented Arabic instruction in Islamic higher education.

Theoretically, this research advances an interactional understanding of moderation as a discourse-based practice that can be scaffolded and assessed through dialogic learning processes. Methodologically, it contributes a dual-domain assessment model integrating language-performance mastery thresholds with behavioral and attitudinal indicators, offering a transferable tool for values-rich pedagogy. Practically, the study highlights that explicit problem framing, value-aligned linguistic supports, and calibrated rubrics can transform abstract moderation ideals into observable classroom behaviors. However, the single-class design, locally defined benchmarks, and limited context constrain generalizability. Future research should adopt multi-site or longitudinal designs to verify persistence and scalability, explore comparative case framings, and test cross-cultural applicability of the dual-domain framework. Overall, the study demonstrates how systematically embedding moderation principles into iterative PBL cycles can bridge global peace-education goals with authentic, measurable practices in Arabic language learning.

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