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A pedagogical model for teaching action research in Kazakhstan's EFL teacher education

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ABSTRACT

This article examines the pedagogical use of action research (AR) in enhancing professional and problem-solving skills of prospective teachers in Kazakhstani secondary schools. The study involved twenty-seven pre-service and novice English as a foreign language (EFL) teachers, all of whom were master's students at Kazakh National University. The study was implemented within the AR course integrated into the master's program curriculum. To support participants' understanding and practical application of AR, we designed "AR tree" model, a visual, cognitive and pedagogical scaffold. It was introduced to make the stages of AR more accessible for novice teachers. After presenting the model, semi-structured interviews were conducted with pre-service teachers to explore its pedagogical value for professional learning. The results indicate that the model strengthened connections between theory and practice, promoted reflective professional thinking, and enable novice teachers to systematically identify classroom challenges and develop pedagogically informed solutions. The study does not propose a new form of AR, instead, the model guided pre-service teachers through each phase, from finding a problem to developing interventions, reflecting with learners, and sharing results.

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1. INTRODUCTION

In today's dynamic educational landscape, professional development is crucial for teachers to stay adaptable to shifting pedagogical approaches and changing learner needs. This is particularly vital for English as a foreign language (EFL) educators, who must continuously evolve to keep up with new methodologies, integrate technology effectively, and foster deeper student engagement. One powerful approach that fosters both personal and professional growth of educators action research (AR), a practitioner-driven methodology that empowers teachers to systematically investigate and improve their own practices in the classroom.

The concept of AR draws on the foundational work of Kurt Lewin, who first introduced the idea in the 1930s, and Corey [1] who applied it to education in the 1950s by emphasizing teachers' involvement in curriculum development. Stenhouse [2] later advanced the notion of "teachers as researchers", highlighting practitioners' role in knowledge creation. Subsequent scholars [3]–[5] further developed AR as a systematic, collaborative, and emancipatory process that links theory with practice. More recent contributions [6]–[10] have emphasized AR's role in reflective teaching, professional development, and the dissemination of best

practices. Several empirical studies [11]–[15] demonstrate AR's positive impact across diverse educational contexts, confirming its potential to enhance reflection, collaboration, and student-teachers' autonomy.

Despite increasing attention to AR in educational discourse and teacher development programs, the challenge in Kazakhstani context lies in the absence of structured, teachable, and context sensitive pedagogical models for introducing AR. Although AR is formally introduced through professional development initiatives and teacher education programs, many teachers often receive limited instructional guidance on how to conceptualize, sequence, and enact the stages of AR in classroom settings. As a result, AR is frequently approached as a procedural or formal requirement rather than as a reflective, inquiry driven practice. As a result, beginning teachers frequently encounter difficulties in translating AR principles into coherent and manageable classroom inquiry. This gap is not related to a lack of AR research, but rather to the need for pedagogically grounded models that support novice teachers' understanding, sequencing, and practical enactment of AR within their specific educational contexts.

Before AR implemented in Kazakhstani EFL education, innovation mainly resulted from top-down reforms such as information and communication technology (ICT) integration, lesson study, and curriculum modernization. However, implementation was inconsistent across regions. Kurmangaliyev [16] revealed infrastructural and professional barriers to ICT use in rural schools, while Amanbayeva [17] noted that lesson study encouraged collaboration but was limited by time and administrative constraints. Similarly, Chizhevskaya and Akparova [18] found that content and language integrated learning (CLIL) teachers improved students' functional literacy through lesson study, though success depended on school support and resources. Later studies [19]–[22] emphasized teachers' strong motivation for professional growth but identified barriers such as insufficient research training and funding.

One of the most significant reforms in Kazakhstan's education system was the introduction of the Head Teacher Leadership Program in 2012 and the establishment of a three-tiered professional development model for teachers. These initiatives, developed in collaboration with the University of Cambridge's Faculty of Education and the JSC Nazarbayev Intellectual Schools' Centre for Teaching Excellence, aimed to modernize teaching practices and strengthen teacher professionalism. As part of these reforms, the curriculum for primary and secondary education was revised to introduce criterion-based assessment, greater integration of ICT, and interactive, student-centered methods of instruction. Since 2013, Cambridge experts have worked closely with the autonomous education organization Nazarbayev Intellectual Schools (NIS) to promote reflective practice and collaborative AR as sustainable models for teacher learning. The goal was to create a professional culture where teachers continuously evaluate, refine, and innovate their classroom practices. In this regard, Kunanbayeva [23] have emphasized the importance of competency-based approaches in language education. Kazakh researchers also note that while professional development initiatives have raised teacher qualifications, challenges remain in secondary schools, including unequal access to resources between urban and rural contexts, limited teacher readiness to implement student-centered approaches, and persistent reliance on traditional, exam-oriented methods of instruction.

AR has become a powerful tool for teacher professional growth because it positions educators not only as practitioners but also as active researchers of their own classrooms. By engaging in AR, teachers become reflective practitioners who systematically evaluate their teaching practices, collect evidence from their classrooms, and make informed changes to improve student learning [6]. This reflective cycle planning, acting, observing, and reflecting creates opportunities for continual improvement. The process of AR fosters ongoing professional development in several ways. First, it helps teachers remain connected with emerging educational theories and practices. Borg [7] emphasizes that research-active teachers are more likely to keep pace with new developments, building a culture of lifelong learning within their profession. Dörnyei [8] further notes that teachers who engage in systematic inquiry often experience higher levels of job satisfaction and motivation, as addressing classroom challenges through research can be both rewarding and empowering. The opportunity to witness tangible improvements in learners' engagement and achievement enhances teachers' enthusiasm for their work and strengthens their professional identity. Another defining feature of AR is its collaborative nature. Projects often involve cooperation with colleagues, students, and other stakeholders, encouraging teamwork and building a shared sense of purpose [9]. This collaboration extends professional learning beyond the individual teacher to the whole school or educational community. Furthermore, when teachers share their AR findings through presentations, publications, or professional networks, they contribute valuable insights to the broader field of language education. Such contributions can inform policy-making, influence curricular reforms, and promote evidence-based practices at the institutional and national levels [10].

The power of AR lies in its unique ability to connect theory and practice. Unlike traditional research, which often takes place in controlled environments with limited relevance to daily classroom realities, AR focuses directly on the challenges teachers face in their professional contexts. Elliott [3] describes AR as studying a social situation with the aim of improving the actions within it. Carr and Kemmis [4] add that AR

is also emancipatory, empowering teachers by giving them more control over their work and challenging traditional hierarchies within education. Altricher *et al.* [5] identify three defining elements of AR: collaborative inquiry, a systematic cycle of action and reflection, and public sharing of results. Together, these features make AR both practical and transformative. The benefits of AR are well documented across diverse educational contexts. In Turkey, Dogan and Kirkgoz [11] found that nine English language instructors who participated in AR improved their reflective thinking, collaborative learning, and self-efficacy, which in turn enhanced their instructional practices. Arefian [12] studying pre-service EFL teachers in Iran, showed that collaborative AR boosted teachers' confidence, autonomy, and problem-solving skills while fostering stronger peer and mentor support networks. Similarly, El Deen [13] examined teacher development in Egypt, finding that mentoring and AR initiatives improved classroom practices and engagement with new methodologies, though institutional challenges and lack of sustained motivation limited long-term impact.

Long-term studies have also confirmed AR's role in sustainable professional development. Sato *et al.* [14] reported that Japanese secondary school teachers engaged in collaborative AR over four years experienced significant changes in their beliefs and practices regarding communicative language teaching. Teachers moved through overlapping stages of professional growth, including challenging long-held beliefs, engaging in reflective experimentation, and navigating difficulties in collaboration due to institutional resistance. Despite obstacles, the study demonstrated AR's capacity to transform teacher practices over extended periods. Al-Obaydi *et al.* [15] investigated pre-service teachers' perceptions of AR and found that while many faced resistance from senior colleagues, the majority viewed AR as a valuable tool for solving classroom challenges and expressed strong willingness to apply it in their future teaching. This highlights the potential of AR to nurture professional autonomy and reflective teaching practices early in a teacher's career.

Before AR gained ground, many EFL classrooms in Kazakhstan relied primarily on top-down reforms and teacher-centered methods, supplemented by efforts to integrate ICT and collaborative models like lesson study, but these were unevenly or partially adopted. For example, in rural secondary schools, Kurmangaliyev [16] found severe barriers to ICT integration: poor internet infrastructure, limited access to devices, and lack of professional development for teachers, which hampered the shift toward digital or blended learning methods. Lesson study was another model being introduced: Amanbayeva [17] from West Kazakhstan showed that in mainstream school teachers engaging in lesson study co-planned lessons, observed each other's instruction, reflected together, but struggled with limited time, heavy teaching loads, and insufficient administrative support. Chizhevskaya and Akparova [18] in Karaganda region studied how CLIL teachers used lesson study, finding that it improved teaching practices and functional literacy in students, but again noted that procedural support, resources, and school culture influence how effectively such innovations can be sustained.

Thus, before AR was formally widespread, educational innovation in Kazakhstan was built on reforms (assessment, ICT, and curriculum change), cascade professional development, and nascent collaborative models, but these were often undermined by infrastructural, resource, and institutional constraints. AR represents a powerful methodology that not only addresses immediate classroom challenges but also supports teachers' long-term professional growth. It encourages reflection, collaboration, and innovation, while empowering teachers to contribute meaningfully to educational change. By blending theory with practice, AR helps bridge the gap between research and classroom realities, ensuring that professional development remains relevant, sustainable, and transformative. A document analysis of 82 graduate dissertations in social studies education in Turkey revealed that although AR was used, many studies lacked core features of the AR cycle, such as systematic implementation of cycles and detailed action planning, and often relied primarily on qualitative methods and interviews. The findings highlight the need for greater methodological fidelity to the principles of AR when conducting and reporting graduate-level AR studies [24].

A recent study by Karibayeva *et al.* [19] confirmed that EFL teachers in Kazakhstan need continuous professional development (CPD) as essential for career growth and skill improvement, yet many face obstacles such as financial constraints, insufficiently flexible training formats, and lack of context-specific programs. This reflects a broader issue in Kazakhstani secondary schools where reforms, though ambitious, often encounter difficulties in practical implementation. Within this context, AR has proven particularly effective: teachers have used it to test innovative strategies like project-based learning, flipped classrooms, and ICT integration, then reflect on outcomes to refine their practice. This has been especially valuable in helping teachers transition from teacher-centered traditions to more interactive, student-centered approaches demanded by modern curricula, building confidence and autonomy in addressing classroom challenges. The study conducted by Berikkhanova *et al.* [25] in Abai University among young educators has shown high interest of implementing AR in their everyday practices. However, the authors indicate a given priority of secondary school teachers towards AR rather than university educators. For graduate-level teachers in universities such as Al-Farabi Kazakh National University, AR has also become a critical tool for connecting theory with practice. In 2024, the discipline "action research" has been implemented to the

program “foreign language teaching”. Ultimately, AR strengthens both pedagogical knowledge and reflective capacity, making it an important mechanism for responding to the current challenges in Kazakhstan’s secondary schools, where reforms require not only structural change but also teacher-driven innovation and adaptability.

At the secondary school level, Nagibova [20] identified significant obstacles to implementing AR, including teachers’ limited prior knowledge of research methods, lack of resources, and insufficient school-level support structures. The findings suggest that while AR is welcomed as a tool for professional growth, its sustainability depends on systemic support and ongoing training. Similar concerns were written in the work of Latanova *et al.* [21], who examined how EFL teachers in higher education planned and conducted AR. They stressed the need for structured planning and collaboration among stakeholders to make AR feasible in Kazakhstan’s context. Their work demonstrates that AR is not only relevant to school teachers but also valuable for university lecturers, particularly those teaching English to students of non-linguistic specialities. A survey conducted among 205 rural school teachers on conducting AR demonstrated systemic barriers as limited digital infrastructure, high workload, and restricted access to professional development. Despite these challenges, the author indicates that teachers are ready to change and create sustainable educational eco system in their classrooms [26].

More recently, Berikkhanova *et al.* [22] have argued for a deeper integration of AR into teacher education programs at Kazakhstani pedagogical universities. Their study, conducted at Abai Kazakh National Pedagogical University, emphasizes that future teachers often lack research competencies and opportunities to apply theory to practice. By embedding AR into teacher preparation, the authors believe that universities can better equip graduates with the skills necessary for reflective practice and innovation in classrooms. Similarly, Tussupbekova *et al.* [27] showed how AR can be used in higher education for students of non-linguistic specialties to adapt English language teaching methods, illustrating AR’s flexibility and potential across diverse educational contexts.

The AR tree model was designed in response to persistent difficulties faced by pre-service and novice EFL teachers in learning and operationalizing AR within the Kazakhstani teacher education context. While AR is conceptually familiar to many beginning teachers, they often struggle to understand its cyclical logic, translate abstract stages into classroom practice, and maintain continuity across research cycles. The tree model addresses these challenges by providing a structured yet flexible pedagogical representation of AR that makes its processes visible, sequentially learnable, and contextually meaningful for novice practitioners. By visually integrating planning, action, observation, reflection, pedagogical orientations, and professional outcomes into a single coherent framework, the model supports teachers in navigating AR as an ongoing professional learning process rather than as an isolated or procedural task. In this way, the tree model directly responds to the need for a teachable and context-sensitive approach to introducing AR in Kazakhstani EFL teacher education.

2. THE PROPOSED METHOD

The “AR tree model” visually represents the dynamic and cyclical nature of the AR process, illustrating how teachers’ professional growth develops through systematic inquiry and reflective practice. The model presented in Figure 1 conceptualizes AR as a living system in which each component—roots, trunk, branches, and leaves—symbolizes key stages and outcomes of the research cycle. At the foundation of the model, the roots represent the four cyclical stages of AR: planning, acting, observing, and reflecting. During the planning stage, teachers identify classroom challenges and design small-scale interventions, referred to as micro-interventions, to address specific learning issues. The acting stage involves implementing these interventions in real classroom contexts, followed by systematic data collection during the observing phase. In the reflecting stage, teachers critically analyze their findings, evaluate the effectiveness of their strategies, and identify directions for further improvement. These interconnected stages form a continuous cycle of inquiry that sustains professional development and pedagogical innovation.

The trunk of the tree symbolizes the practical core of AR—implementation and data collection. This part connects theory and practice, as teachers experiment with instructional strategies while gathering empirical evidence of their impact on student learning. The process ensures that professional reflection is grounded in classroom realities, reinforcing the teacher’s role as both practitioner and researcher. Extending from the trunk are the branches, which represent the pedagogical orientations guiding AR practices. On one side, the instructivist branch emphasizes structured, teacher-led learning that includes communicative, task-based, and technology-enhanced activities, as well as form-focused instruction. On the other side, the constructivist branch highlights student-centered learning through receptive and productive skills activities, knowledge sharing, and reflection with learners. Together, these approaches demonstrate the balance between guided instruction and learner autonomy within AR-based classrooms. The leaves and fruits at the top of the

tree symbolize the outcomes of AR. These include teacher growth, knowledge sharing, and reflection with learners. Through this process, teachers enhance their professional competencies, contribute to collaborative knowledge within the educational community, and promote reflective engagement among their students. The circular arrows surrounding the model illustrate the continuous and iterative nature of AR, where each completed cycle leads to new insights and renewed inquiry. The model was developed collaboratively by the researcher and teacher educators, based on foundational AR frameworks by Burns [6], Kemmis and McTaggart [28], and adapted to the Kazakhstani EFL teacher education context. It emphasizes continuous inquiry, teacher autonomy, and the integration of reflection into everyday teaching practice.

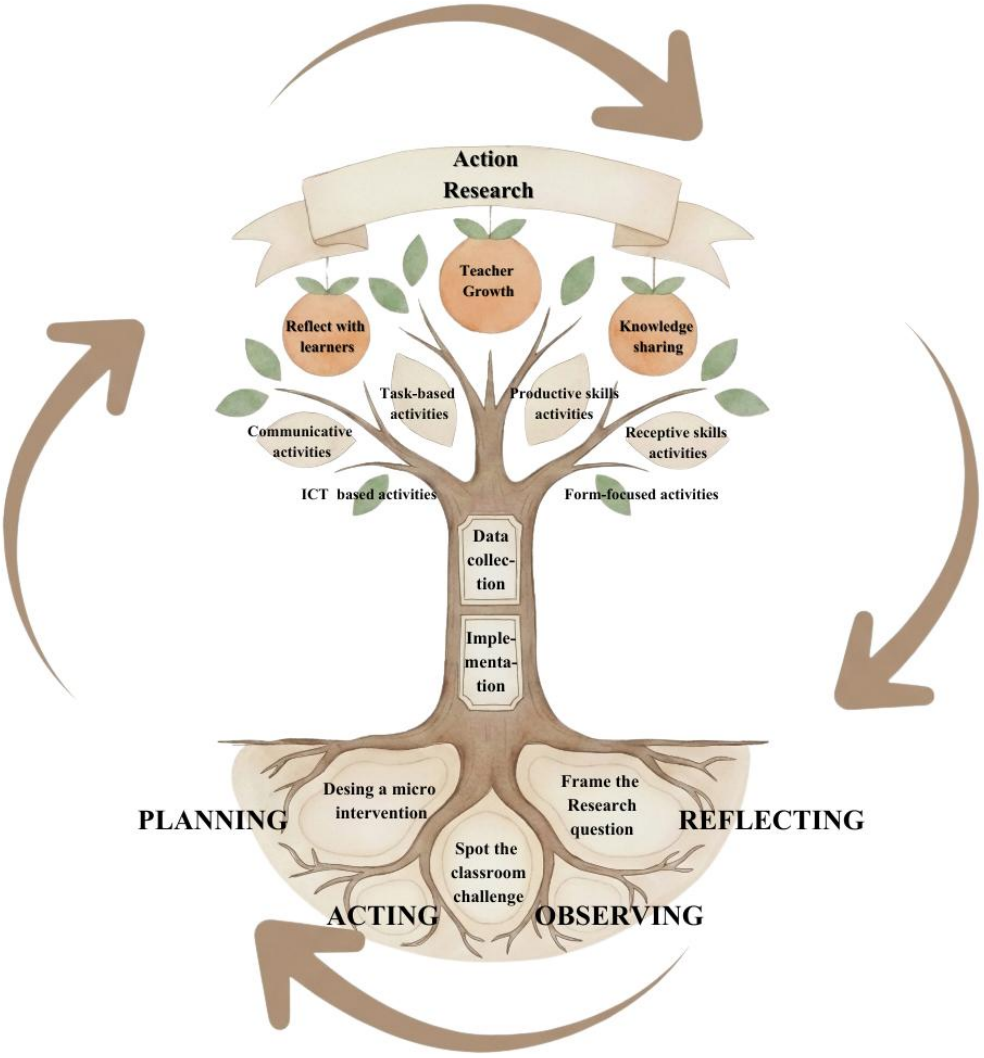

Figure 1. The "AR tree model" proposed by the authors

The AR tree model stands out for its integrative and visually structured design, which connects theoretical foundations with classroom practice in a clear and organic way. Unlike traditional linear models of AR, this model emphasizes the interdependence of its components—roots, trunk, branches, and fruits—illustrating how each stage contributes to continuous teacher development. Its cyclical nature encourages sustained inquiry rather than one-time experimentation, allowing EFL teachers to refine their pedagogical approaches through reflection and evidence-based adjustments.

For EFL teachers, the model is particularly effective and practical because it aligns with the dynamic realities of language teaching. It bridges instructivist and constructivist approaches, offering flexibility to design lessons that balance form-focused instruction with communicative, student-centered learning. Through this integration, teachers can respond to diverse learner needs, experiment with technology-enhanced activities, and cultivate both linguistic accuracy and fluency. The model's focus on teacher growth and knowledge sharing fosters a professional learning community, where teachers not only improve their

own practice but also contribute to collective expertise. The process of reflection with learners further enhances classroom interaction, promoting metacognitive awareness and learner autonomy—core principles of modern EFL pedagogy.

3. METHOD

The study involved twenty-seven pre-service and novice EFL teachers, all of whom were master's students at Kazakh National University participating in teacher education programs. The participants represented a diverse mix in terms of age, teaching experience, and educational background, which provided a comprehensive view of how AR supports teacher growth across various contexts. The research was conducted over a six-month period and aimed to explore how a structured and visual model of AR could facilitate reflective practice, problem-solving, and innovation among emerging educators.

The study was implemented within the framework of the AR course integrated into the master's curriculum. During the preparatory phase, which spanned three weeks, teachers engaged in reflective and deliberative processes to define their research topics. This phase was crucial for establishing a solid foundation for their subsequent inquiries. The process involved extensive intellectual exploration and collaborative dialogue. Teachers frequently exchanged ideas, posed questions within their group, and leveraged collective knowledge to refine their research focus and align their topics with the overarching goals of their AR projects. The implementation of AR was found to have a significant impact on the development of teachers' professional competencies, particularly in fostering critical thinking, self-reflection, and classroom-based innovation.

The questions were designed collaboratively by the researcher and teacher educators to capture both the procedural and reflective dimensions of the participants' experience with AR. This alignment made it possible to examine how teachers identified classroom problems, planned and implemented interventions, collaborated with peers, and reflected on their outcomes. The interview questions are provided in Table 1.

Table 1. Interview questions

No.	Question
1	How did you feel when you first started conducting action research? Did your perception of research change over time?
2	What motivated you to participate in action research during your teacher education program?
3	How did the action research tree model help you understand the process of classroom inquiry?
4	Can you describe how you identified and formulated your classroom problem for action research?
5	What methods or tools did you use to collect data, and how confident did you feel about using them?
6	How did collaboration with your peers or supervisors influence your action research experience?
7	What challenges did you face while balancing teaching and research responsibilities?
8	In what ways did reflection help you grow as a teacher and researcher?
9	How did your action research project affect your students' motivation, participation, or learning outcomes?
10	What changes did you notice in your own teaching after completing the action research project?
11	How did you ensure ethical considerations, such as confidentiality and consent, were followed in your research?
12	Looking back, what do you think is the most valuable lesson you learned from conducting action research?
13	How do you plan to apply what you learned about action research in your future teaching practice?

Data analysis followed an inductive thematic approach. After transcription, all interview texts were carefully read multiple times to identify emerging themes and patterns. Codes were initially derived from the stages of the tree model, but additional sub-themes such as collaboration, emotional challenges, and professional identity were generated from the data itself. The researcher employed qualitative coding software to organize and categorize responses systematically, ensuring consistency and traceability throughout the analysis. Peer debriefing with two external experts in EFL teacher education helped enhance the credibility and reliability of the findings. Triangulation was also achieved through the use of reflective journals and classroom observation notes, which complemented the interview data and provided a holistic picture of teachers' engagement with AR. The integration of multiple data sources strengthened the study's validity and contributed to a richer understanding of how the tree model facilitated teachers' inquiry-based professional development.

Interview is a frequently used research method in social sciences, including education. A semi-structured interview is a qualitative research method that involves a set of predetermined core questions or topics the interviewer intends to cover, but allows for flexibility in the conversation's flow, question ordering, and the introduction of new questions based on the participant's responses and the developing themes of the discussion. This approach, as discussed by Bernard [29], Kvale and Brinkmann [30] learning the craft of qualitative research interviewing, strikes a balance between the rigidity of structured interviews and the open-ended nature of unstructured interviews. It ensures that essential information is gathered across all

interviews while providing the opportunity to probe deeper into specific, nuanced areas raised by the interviewee, thus yielding rich, detailed, and comparable qualitative data. Magaldi and Berler [31] describe a semi-structured interview as an exploratory method usually with ready guide and focused on a specific topic.

Each interview lasted approximately 30–40 minutes and was conducted individually in English. With participants' consent, the interviews were audio-recorded and later transcribed verbatim for analysis. In line with ethical research standards, participation was voluntary, and all participants provided informed consent prior to the study. Anonymity and confidentiality were maintained throughout the research process, and data were used solely for academic purposes.

4. RESULTS AND DISCUSSION

To ensure methodological rigor, the study employed triangulation by collecting data through interviews, classroom observations, and teachers' reflective journals, providing multiple perspectives on participants' experiences with the AR tree model. However, in this paper, we focused more on the interview results. Across the research process, teachers engaged systematically with the tree model, beginning with identifying classroom problems (roots), developing focused research questions (trunk), implementing interventions (branches), and reflecting on outcomes (fruits). Analysis of these data sources revealed that the visual and structured model supported teachers in understanding the stages of classroom inquiry, increasing their confidence in conducting research, and fostering reflective practice.

Participants reported that their motivation to engage in AR stemmed from a desire to enhance their teaching practice and explore innovative strategies in the classroom. As one teacher (P4) noted, "*I wanted to improve my teaching and find ways to make lessons more engaging*," highlighting a practical focus on meeting student needs. Another participant (P9) expressed curiosity about experimenting with new approaches, stating, "*I was curious about trying new methods and seeing if they actually worked with my students*." These responses suggest that teachers were driven not merely by academic requirements but by a professional interest in applying inquiry-based processes to address real classroom challenges.

Teachers consistently reported that the pedagogical model of the tree helped them conceptualize the research process as manageable and iterative, rather than abstract or overwhelming. As one participant (P7) explained, "*the model was like a map for me. Every time I got lost, I returned to the tree and checked where I was*." Observational notes and reflective journals collaborated interview findings, showing that participants applied the model to plan lessons, collect data, and engage in discussions with peers. Another participant (P12) emphasized the model's practical benefits, stating, "*it gave me a clear structure and helped me stay focused on each stage*." These reflections suggest that the tree model not only guided teachers in systematically planning and implementing interventions but also reinforced their understanding of research as a cyclical and iterative process, rather than a linear or abstract task.

Participants described a systematic approach to identifying and formulating classroom problems through the AR process. One teacher (P3) explained, "*I noticed my students were quiet during speaking activities, so I made that my main problem*," while another (P5) reflected, "*I kept observation notes and realized many students struggled with vocabulary retention, which became my focus*." These examples illustrate that teachers were able to move beyond initial impressions or assumptions, using structured observation and reflection to pinpoint specific pedagogical challenges.

Teachers used a range of data collection methods and tools to investigate their classroom problems, including student surveys, classroom observations, lesson recordings, reflective journals, questionnaires, and peer feedback. One teacher (P24) shared, "*I mainly used student surveys and classroom observations. At first, I was unsure about analyzing the data, but following the AR cycle made it easier*," while another teacher (P20) noted, "*I recorded lessons and kept reflective journals. It was challenging at first, but I gained confidence after a few cycles*." One more participant (P2) emphasized the role of supervisory support, stating, "*questionnaires and peer feedback were my main tools. I felt fairly confident because I had clear guidance from my supervisor*."

A range of experiences in balancing teaching responsibilities with conducting AR, highlighting both challenges and moments of effective integration were used by participants. Several teachers described difficulties, particularly in managing time and sustaining reflective practices alongside full teaching loads. One participant (P1) explained, "*managing time was difficult. Sometimes collecting data felt like extra work on top of teaching*," while another (P9) noted, "*keeping up with reflections and observations while teaching full-time was a struggle*." A third teacher (P3) reflected on aligning research with curriculum requirements, stating, "*it was hard to plan interventions and still cover the curriculum, but the AR cycle helped me integrate research gradually*." At the same time, some participants (P20) reported more positive experiences, "*it wasn't so hard for me balancing teaching and research, I got support from our supervisor all the time, and the Tree Model was quite clear to manage*," and another (P26) shared, "*at the first days it was a bit difficult, but then I handled everything, researching and teaching were great experience to mix*." These

contrasting perspectives highlight that while the dual demands of teaching and research posed practical challenges, the structured guidance of the AR tree model, together with iterative practice and peer or supervisory support, helped many teachers integrate research into their daily classroom routines. Conceptually, the findings suggest that, for some teachers, conducting AR alongside teaching can be a synergistic experience, enhancing reflective practice and professional growth rather than being purely burdensome.

Participants consistently emphasized that reflection was a central component of their growth as both teachers and researchers. One teacher (P16) explained, "*reflection made me more aware of my strengths and weaknesses. I now plan lessons more thoughtfully*," highlighting how reflective practice encouraged deliberate lesson design and self-assessment. Another participant (P21) noted, "*it helped me connect theory to practice and adapt strategies based on student responses*," illustrating that reflection enabled teachers to make evidence-informed adjustments, linking pedagogical concepts with actual classroom dynamics. One more participant (P27) described the collaborative dimension of reflection, stating, "*reflecting with students gave me new ideas for encouraging participation and autonomy*," demonstrating that reflective practice extended beyond teacher self-evaluation to actively involve learners in the inquiry process.

The findings also indicate that participants perceived positive, though context-dependent, changes in student engagement and learning as a result of their AR projects. Teachers reported that "*some students showed improved performance, and overall, class participation was higher*," suggesting that targeted interventions informed by classroom data contributed to more active learner involvement. Rather than attributing these changes solely to specific techniques, participants emphasized that the inquiry process itself encouraged them to respond more attentively to student needs and classroom dynamics. This was closely linked to noticeable shifts in teachers' own pedagogical approaches. After completing the AR cycle, one participant (P3) reflected, "*I became more flexible in my lesson planning; the tree model helped me to divide approaches into instructive and constructive, and now I usually ask myself whether I am being beneficial in this particular task*." This statement illustrates a move toward reflective, purpose-driven decision-making, where lesson design is guided by pedagogical value rather than routine. The AR tree model functioned as a cognitive framework that supported ongoing self-questioning, enabling teachers to evaluate the intent and impact of instructional tasks more critically.

The ethical considerations, 11th question of our interview was a strong recommendation and was observed by the supervisor. Ethical considerations were treated as a non-negotiable component of the AR process and were consistently observed by all participants. As part of their methodological preparation, the novice teachers received explicit instruction on research ethics, with particular emphasis on informed consent, confidentiality, and responsible data handling. Consequently, all 27 participants reported obtaining formal permission from students' parents prior to initiating data collection or implementing research-based interventions in their classrooms. This procedure ensured that participation was voluntary and that stakeholders were fully informed about the purpose and scope of the research. In addition, teachers were guided to anonymize student data and to use collected information solely for educational and reflective purposes. The uniform application of ethical procedures across all AR projects demonstrates a high level of methodological consistency and ethical awareness, reinforcing the credibility of the findings and aligning the study with established standards for practitioner research in educational contexts.

Participants identified the most valuable outcome of conducting AR as a fundamental shift in how they understood professional growth and classroom improvement. Several teachers emphasized that even small, systematically planned changes could lead to meaningful improvements in student learning. In particular, the AR tree model was highlighted as a key mediating tool that supported this realization, as it helped participants clearly understand the logic of AR and provided structured guidance throughout the inquiry process. One participant noted that the model not only clarified the stages of AR but also served as a practical navigational framework that they intended to use regularly in their English teaching practice. Other participants stressed the complementary relationship between teaching and research, describing reflection as a central mechanism for ongoing improvement rather than a separate academic task. Additionally, continuous inquiry was viewed as a means of deepening teachers' understanding of their students and fostering sustained professional development.

The last future-oriented responses indicate that AR was not perceived as a one-time academic requirement but as a sustainable pedagogical approach to be integrated into everyday teaching practice. Several teachers expressed an intention to continue designing small-scale classroom interventions, systematically observing their effects, and engaging in structured reflection. Notably, the AR tree model was again identified as a central guiding framework, supporting teachers in navigating the inquiry cycle and maintaining focus throughout the process. Other participants (P3) highlighted plans to strengthen collaborative practices, including peer discussion and student involvement in reflective activities, suggesting a shift toward more participatory and dialogic classroom environments. "*I will continue designing small interventions, observing their effects, and reflecting. Tree model will be my guide*."

In addition to increased motivation and confidence, the results also revealed a notable shift in participants' attitudes toward research as a practical and transformative tool for professional development. However, by the end of the project, participants demonstrated a clearer understanding of how inquiry could directly influence and improve learning outcomes. This change was particularly visible in their growing ability to identify pedagogical challenges independently and to apply data-driven solutions rather than relying on intuition or routine methods. The process of collecting and analyzing classroom data also helped participants develop analytical thinking, as they learned to interpret student performance results, compare progress over time, and make evidence-based adjustments to their lessons.

Another significant finding concerned the development of collaboration and peer learning among participants. Teachers frequently mentioned that discussing their projects in small groups, sharing observation notes, and exchanging feedback strengthened their confidence and expanded their methodological repertoire. This collaborative element also contributed to emotional resilience, as teachers felt supported by a community of peers facing similar challenges. Moreover, participants reported that the tree model's visual structure simplified complex research processes, making the steps of AR more accessible and less intimidating. Several teachers described the model as a "guide" or "map" that helped them monitor their progress and maintain focus on specific research goals.

These findings align with previous studies emphasizing that structured models of AR support teachers in managing the complexity of classroom inquiry and enhance their ability to connect theory with practice. The tree model, in particular, contributed to participants' conceptual understanding of research stages and promoted sustainable habits of reflection. Teachers repeatedly expressed that the visual pedagogical model of the tree helped them internalize AR as a continuous and evolving process, not as a linear academic assignment. This shift in mindset encouraged autonomy and for pre-service teachers. Furthermore, the collaborative component of the course fostered a professional learning community where teachers shared insights, co-constructed knowledge, and gained confidence in implementing innovative strategies. The model's combination of instructivist and constructivist elements also reflected the realities of EFL classrooms, helping teachers balance explicit instruction with communicative, learner-centered approaches. The tree model served as both a pedagogical and psychological scaffold, guiding teachers through the complexities of research while nurturing motivation, reflection, and professional self-efficacy.

5. CONCLUSION

This study explored the experiences of pre-service EFL teachers engaging in AR through the application of the AR tree model, designed to connect theoretical knowledge with classroom realities. The findings demonstrate that the model served as a valuable pedagogical and reflective framework, guiding teachers through systematic inquiry while fostering confidence, autonomy, and professional growth. Participants reported that engaging with the cyclical stages of AR—planning, acting, observing, and reflecting helped them better understand the nature of classroom problems, design targeted solutions, and evaluate their impact based on evidence.

The tree model proved particularly effective in visualizing the interconnectedness of teaching and research processes. Its structure allowed participants to approach inquiry not as an isolated academic task but as an organic and ongoing part of their teaching practice. The balance between instructivist and constructivist orientations supported flexibility in lesson design, enabling teachers to respond to learner diversity and promote reflective engagement. Importantly, the study highlights that master's students who participated in AR not only developed research competence but also adopted a more critical and inquiry-based stance toward their professional roles.

Overall, the integration of AR into teacher education programs contributes to the development of reflective practitioners capable of making informed pedagogical decisions. The tree model offers a practical and contextually relevant framework for supporting this process, especially in the Kazakhstani EFL context. Future studies could expand on these findings by examining the long-term impact of AR engagement on teachers' professional identity, classroom practices, and collaboration within educational communities.

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AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
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Makhabbat Adilkhan	✓		✓	✓			✓			✓	✓		✓	✓

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest

DATA AVAILABILITY

The data that support the findings of this study are available on request from the corresponding author, [TB]. The data, which contain information that could compromise the privacy of research participants, are not publicly available due to certain restrictions.

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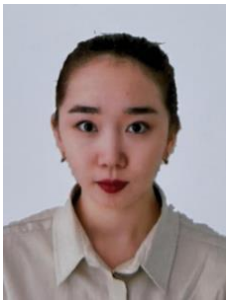

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