Integration of Innovative Educational Technologies into the Process of Soft Skills Formation among Future Foreign Language Teachers

Akbike Boranbayeva[1,*], Gulnur Yerik[1], Svetlana Mikhaelovna Minasyan[2], and Sholpan Bagitzhanova[3]

[1]Department of Foreign Languages, L. N. Gumilyov Eurasian National University, Astana, Kazakhstan
[2]Department of Foreign Languages, Ijevan Branch of Yerevan State University, Armenia
[3]Department of Foreign Languages, Arkalyk Pedagogical University named after I. Altynsarin, Arkalyk, Kazakhstan
Email: akbike90gmail.com (A.B.); yerikgulnur@gmail.com (G.Y.); sminasyan@ysu.am (S.M.M.); sholpan.bagitzhanova@api.edu.kz (S.B.)
*Corresponding author

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***Abstract*—The aim of this study was to analyze the impact of the integration of innovative educational technologies on the formation of soft skills among future teachers of foreign languages. A quasi—research model with a single group, the pre- and post-test measurement, was used as a methodological basis. The study involved 20 students studying in a pedagogical specialty with a focus on teaching foreign languages. As part of the work, an educational program was developed and implemented that includes elements of problem-based research training and the use of digital innovative tools such as interactive platforms, visual storytelling tools, simulations and Information and Communications Technology (ICT)-based team projects. The program consisted of four modules, each integrating interactive technologies, project-based tasks, gamification elements, and reflective practices aimed at developing communication, critical thinking, creativity, teamwork, adaptability, and self-organization. Data collection was carried out using both quantitative and qualitative methods. Quantitative data was collected using a developed test on key soft skills (communication, critical thinking, creativity, teamwork, self—organization), and qualitative data was collected through free observations and analysis of students' reflective journals. The nonparametric Wilcoxon test for dependent samples was used to analyze the quantitative data. Qualitative data was analyzed using the content analysis method. The results of the study showed that the integration of innovative technologies contributes to the development of the following flexible skills: critical thinking, creativity, communicative competence and teamwork skills. Innovative educational technologies have a positive impact on the formation of individual components of soft skills among future foreign language teachers, especially if they are purposefully integrated into the learning process.**

***Keywords*—interdisciplinary approach, soft skills, innovative educational technologies, development of flexible skills, future foreign language teachers**

I. Introduction

Modern education requires rethinking traditional approaches to learning, especially in the context of training future teachers of foreign languages. One of the key trends is the integration of various disciplines and technologies in order to create comprehensive and rich educational environments. Such an association allows us to develop soft skills, including critical thinking, creativity, communicative competence and the ability to work in a team—those qualities that are especially in demand in the teaching profession today. As noted by Nikitina [1], an interdisciplinary approach to teaching encourages students to view problems from different perspectives and generates a high level of thinking. Similarly, Jonassen [2] emphasizes that integration of different fields contributes to a deeper understanding of information. According to Klaassen [3], there are three main approaches to combining disciplines for educational purposes: thematic, integrated, and interdisciplinary.

In this study, the term innovative educational technologies is defined as digital tools and pedagogical solutions that go beyond traditional classroom instruction and are purposefully designed to stimulate higher-order thinking, collaboration, and self-regulation. Following prior classifications [4], such technologies can be grouped into three categories: (1) adaptive learning technologies (e.g., AI-driven platforms, intelligent tutoring systems) that personalize learning pathways and provide feedback, grounded in Self-Regulated Learning (SRL) theory; (2) immersive and experiential technologies (e.g., simulations, VR/AR environments, gamification) that foster learning through experience, aligned with experiential learning theory; (3) collaborative and communicative platforms (e.g., Padlet, Trello, online discussion tools) that enable knowledge co-construction and collective problem solving, rooted in socio-constructivist approaches.

This taxonomy provides conceptual clarity and ensures that the selection of tools in this study is not eclectic but theoretically grounded. Each tool was chosen because of its capacity to activate specific mechanisms of soft skills development such as reflection, collaboration, adaptability, and decision-making.

The purpose of the present research is therefore to examine whether the introduction of innovative educational technologies based on interdisciplinarity and inquiry-based learning is associated with the development of soft skills among students preparing to become foreign language teachers. To achieve this goal, the following research questions are posed:

1) Does the integration of innovative technologies with interdisciplinary methods contribute to the development of soft skills among students of pedagogical specialties?
2) To what extent do active, research-based learning methods (digital tools, simulations, collaborative and project tasks) foster the development of critical and creative thinking, communication, cooperation, self-organization, and presentation skills?
3) Do the qualitative data from observations, interviews, and

reflective tasks confirm the quantitative results on soft skills development?

II. Literature Review

In recent years, research on technology-enhanced learning has increasingly emphasized the integration of digital tools for the purposeful development of soft skills in teacher education. A growing number of systematic reviews and empirical studies demonstrate that technology-mediated environments can effectively foster collaboration, Self-Regulated Learning (SRL), and higher-order cognitive processes [5–7]. For example, Crompton [8] highlight that interactive and adaptive platforms significantly enhance communication and teamwork skills, while studies by Lee and Kim [9] illustrate how learning analytics can be applied to measure SRL behaviors such as goal-setting, self-monitoring, and reflection.

A central challenge noted in recent scholarship is not only the implementation of digital tools but also their alignment with validated measurement approaches. According to Järvelä *et al.* [10], the analysis of multimodal data (e.g., log files, discourse, physiological signals) provides deeper insights into the dynamics of soft-skill development than traditional self-report surveys. Similarly, Panadero *et al.* [11] argue that combining inquiry-based pedagogies with digital environments allows both the development and the real-time measurement of metacognitive and collaborative skills, thereby connecting instructional design with measurable learning outcomes.

Recent controlled and quasi-experimental studies provide evidence that immersive and gamified technologies are particularly effective for building critical thinking, adaptability, and creativity among pre-service teachers. For instance, Kolesnik *et al.* [12] demonstrate that gamified simulations increase collaborative problem solving, while research by Mohammed and Ozdamli [13] confirms that virtual and augmented reality environments significantly improve reflective and adaptive capacities. Importantly, these interventions use validated instruments and experimental designs to capture soft-skill gains, ensuring methodological rigor.

Despite this growing body of work, several reviews emphasize that many teacher education curricula still lack systematic approaches to embedding and assessing soft skills [14, 15]. The literature suggests that innovative technologies are most effective when they are explicitly linked to inquiry-based learning, SRL frameworks, and collaborative project designs [16–20]. This aligns with the present study's design, which integrates adaptive, immersive, and collaborative technologies in structured modules, while employing both validated assessment tools and qualitative methods to triangulate outcomes.

Taken together, recent scholarship demonstrates that the integration of innovative educational technologies can produce measurable improvements in soft skills when supported by systematic design and robust assessment. Building on this evidence, the current research positions its intervention within contemporary approaches to SRL measurement, learning analytics, and technology-mediated soft-skill development in teacher education.

III. Materials and Methods

A. Research Design

This study employed a one-group pre-test/post-test experimental design aimed at assessing the effectiveness of integrating innovative educational technologies in the formation of soft skills among future foreign language teachers.

The overall research design is illustrated in Fig. 1, which demonstrates the sequence from pre-test diagnostics through the intervention modules to post-test evaluation and data analysis.

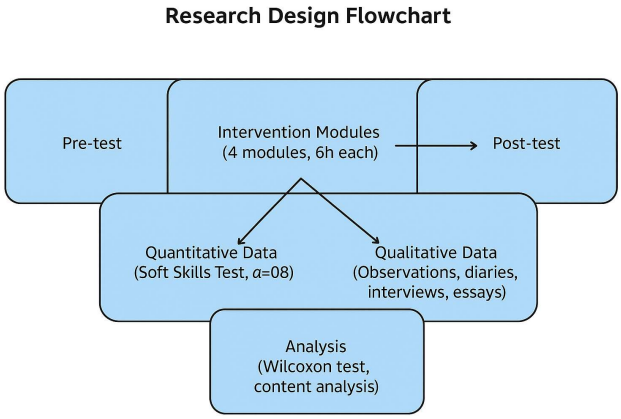

Fig. 1. Research design of the study.

A single experimental group of students was tested before and after the educational intervention. This approach allowed us to measure changes in the same cohort, which corresponds to the research objective—to explore potential dynamics in soft skills development.

To strengthen internal validity, a triangulation strategy was applied, combining quantitative and qualitative methods. Quantitative data were obtained from diagnostic questionnaires and a specially developed Soft Skills Assessment Test (32 items, Cronbach's $\alpha = 0.82$). Qualitative data included unstructured classroom observations, reflective diaries, interviews, and essays, which provided deeper insights into students' behavioral and cognitive changes during the intervention.

The intervention itself consisted of four modules (6 academic hours each), integrating interactive technologies, project-based tasks, gamification, and reflective practices. Each module was explicitly linked to one category of innovative technologies. For example, Module 1 emphasized collaborative platforms (Padlet, Zoom breakout rooms) to foster communication and teamwork, grounded in socio-constructivist theory. Module 2 used immersive approaches (gamification and digital storytelling) to enhance creativity and critical thinking through experiential learning. Module 3 incorporated adaptive technologies (time management simulators, AI-based scheduling tools) aligned with SRL theory to improve adaptability and self-organization. Finally, Module 4 combined reflective digital diaries and art-pedagogy tasks to stimulate metacognition and emotional intelligence. This design ensured that the manipulation of "innovation" was systematic, theoretically justified, and operationalized as a set of mechanisms expected to produce measurable changes in soft skills.

The collected data were analyzed using both parametric and non-parametric statistical methods (paired t-test / Wilcoxon Signed-Rank Test, depending on distribution), complemented by content analysis of qualitative materials. This comprehensive design ensured a reliable evaluation of the effectiveness of innovative teaching methods in fostering professionally relevant competencies among future language teachers.

B. Study Participants

The study was conducted in the spring semester of the 2024–2025 academic year at the pedagogical faculty of one of the state universities. The sample consisted of 20 third-year students (14 female, 6 male) majoring in "Foreign language: two foreign languages". All participants completed the additional course "Innovative Educational Technologies in Teaching Foreign Languages". which emphasized the development of soft skills through project, digital, and collaborative activities.

The choice of this group was due to the fact that at this stage of training, future teachers already possess basic subject and methodological knowledge, which allows them to focus on the formation of supra-professional competencies in the context of innovative approaches.

C. Data Collection Tools

Both quantitative and qualitative instruments were applied. Quantitative tools included the Soft Skills Assessment Test and diagnostic questionnaires. Qualitative data were collected through unstructured classroom observation, essays, reflective diaries, and interviews.

This multi-method approach increased the reliability of results and allowed for deeper interpretation of students' developmental dynamics.

1) Flexible skills assessment test

The diagnostic test focused on key components of soft skills relevant to foreign language teacher training: communication, critical thinking, creativity, teamwork, adaptability, and digital literacy.

Initially, 37 tasks were created, and after expert validation (involving three pedagogical professors, one methodology specialist, and two digital technology lecturers) the final test included 32 tasks. Trial testing was conducted with 210 students not participating in the main experiment. Cronbach's $\alpha = 0.82$ confirmed high reliability.

The assignment of test items to particular soft skills was based on clearly defined criteria developed during the expert validation stage. For example, items requiring analysis of contradictory statements and formulation of reasoned judgments were categorized under critical thinking; tasks that involved peer interaction, feedback exchange, or dialogue simulation were grouped under communication and argumentation; and exercises related to planning, scheduling, or prioritizing activities were linked to time management. Similarly, assignments oriented toward generating new teaching solutions, designing materials, or visualizing pedagogical concepts were associated with creativity and pedagogical design.

Tasks were distributed across competencies, as shown in Table 1.

Table 1. Integration of educational technologies into the development of soft skills

Soft Skills	Educational tasks / Test elements
Empathy and active listening	1, 3, 9
Communication and argumentation	2, 6, 14
Critical thinking	4, 11
Forecasting and decision-making	5, 12
Time management	7, 10, 15
Flexibility and adaptability	8, 13
Creativity and design of pedagogical solutions	16, 17, 22
Using digital tools in teaching	18, 24
Self-regulation and self-reflection	19, 23
Collecting and structuring information	20, 25
Maintaining digital documentation	21, 26
Data analysis and systematization	27, 28
Interpretation of pedagogical situations	29, 30
Public presentation skills	31, 32

2) Unstructured observation

Unstructured classroom observation was applied throughout the educational cycle to capture students' behavioral, cognitive, and communicative reactions while performing soft-skill-related tasks. To reduce the risk of observer bias, two researchers participated in the process: the first author served as the primary observer, while a second researcher independently reviewed and cross-checked the observation notes. All observations were coded using a content-analysis scheme that included predefined categories (engagement, teamwork, empathy, initiative, adaptability, and reactions to digital tools). The coding framework was developed in advance based on the literature on soft-skill assessment and piloted on a small sample of classroom episodes. Each episode was coded twice, and inter-rater agreement was calculated (Cohen's $\kappa = 0.79$), indicating substantial reliability. Any discrepancies were discussed and resolved jointly.

This procedure ensured that the data obtained were not limited to the subjective impressions of a single researcher but were supported by systematic coding and cross-validation. Observational findings were subsequently triangulated with quantitative test results and reflective diaries to enhance the internal validity of the study.

Data obtained were triangulated with quantitative results to enhance internal validity.

D. Realization

The educational intervention was organized as a sequence of four modules, each lasting six academic hours (40 min/h), for a total of 24 h. The modules were delivered consecutively over four weeks, with one module per week.

To ensure consistency, two instructors with prior training in innovative pedagogy and digital platforms conducted the intervention. Before implementation, they completed a short instructor training workshop (8 h) that covered the use of collaborative platforms (Padlet, Zoom), gamification tools (Classcraft), and reflective practices.

Each module included two structured parts:

1) Interactive-oriented learning (IEE)—emphasis on critical thinking, problem-solving, teamwork, and digital literacy.
2) Visual associative learning (VAO)—emphasis on creativity, communication, and emotional intelligence.

Students were expected to engage in 3–4 activities per module, combining synchronous group work (Zoom breakout rooms, collaborative boards) and asynchronous

tasks (podcasts, reflective diaries). The average student workload per week was 6–8 h, including both classroom activities and independent preparation.

Digital platforms were configured in advance: Padlet boards were pre-structured with columns for group contributions; Classcraft was customized with adapted rules for collaborative quests; Google Docs templates were created for reflective diaries.

Fidelity checks were built into the design. Each session followed a standardized script, and instructors documented implementation in observation logs. Student attendance and task completion rates were monitored via platform analytics (Zoom reports, Padlet activity logs). Random checks of student submissions (e.g., infographics, podcasts) were performed to ensure alignment with intended module outcomes.

Table 2 presents the modules, their sequence, planned learning outcomes, type of activities, and duration.

Table 2. Integration of modules for the development of soft skills using innovative educational technologies for future teachers of foreign languages

Module	Planned learning outcomes	Key activities (duration: 4 h per module)
1	Development of effective communication skills for professional activity	Online discussions with international peers; role-play "teacher–student talk"; pair work in Zoom with feedback; creation of video presentations; design of infographics on communication barriers
2	Formation of teamwork and critical thinking skills	Collaborative tasks in Padlet/Trello; group case solving; creation of the podcast "Teacher Talk"; visualization of educational concepts using Canvas
3	Mastering time management and adaptability to changes	Online quests and interactive schedules; micro-projects with deadlines; gamified activities with Classcraft; digital challenge "24 h as a teacher"
4	Development of emotional intelligence and reflective skills	Digital teacher's diary (Google Docs); self-assessment surveys; creative collage "Portrait of an ideal teacher"; poster "My emotions in class"

IV. Results

A. Distribution Analysis

Before the main analysis, the normality of data distribution was tested using the Shapiro–Wilk test, since the sample size was < 30. Results (Table 3) indicate that most data did not follow a normal distribution, justifying the use of non-parametric statistics.

As shown in Table 3, the p-values of the Shapiro–Wilk test were below the 0.05 threshold for both pre-test and post-test indicators across most soft skills. Results (Table 3) indicate that most data did not follow a normal distribution, confirming the choice of non-parametric tests.

Table 3. Results of checking the normality of the distribution (Shapiro-Wilk test)

Assessed soft skills	Pre-Test: Statistics	df	*P*	Post-Test: Statistics	df	*p*
Empathy and active listening	0.54	20	0.00*	0.85	20	0.01*
Communication and argumentation	0.63	20	0.00*	0.43	20	0.00*
Critical thinking	0.64	20	0.00*	0.49	20	0.00*
Forecasting and decision-making	0.52	20	0.00*	0.35	20	0.00*
Time management	0.58	20	0.00*	0.49	20	0.00*
Flexibility and adaptability	0.54	20	0.00*	0.61	20	0.00*
Creativity and design of pedagogical solutions	0.87	20	0.01*	0.82	20	0.00*
Using digital tools in teaching	0.84	20	0.00*	0.70	20	0.00*
Self-regulation and self-reflection	0.46	20	0.00*	0.41	20	0.00*
Collecting and structuring information	0.80	20	0.00*	0.77	20	0.00*
Maintaining digital documentation	0.78	20	0.00*	0.71	20	0.00*
Data analysis and systematization	0.77	20	0.00*	0.79	20	0.00*
Interpretation of pedagogical situations	0.80	20	0.00*	0.77	20	0.00*
Public presentation skills	0.52	20	0.00*	0.52	20	0.00*
Total	**0.86**	20	**0.01***	**0.85**	20	**0.01***

Note: * $p < 0.05$ indicates a significant deviation from normal distribution.

B. General Comparison (Pre- and Post-Test)

To evaluate overall differences between pre-test and post-test scores, the Wilcoxon Signed-Rank Test was applied. Results (Table 4) showed no statistically significant difference ($z = -1.87$, $p = 0.06$). Although the direction of mean ranks suggests higher post-test scores, this result should not be interpreted as evidence of improvement but only as a descriptive indication.

According to the Wilcoxon Signed-Rank Test results presented in Table 4, no statistically significant differences were found between the pre-test and post-test scores ($z = -1.87$, $p = 0.06$). Despite the absence of statistical significance, the increase in average ranks in the post-test suggests a potential positive trend in soft skills development, though causality cannot be firmly established.

Table 4. Comparison of results before and after the implementation of the educational program (Wilcoxon Signed-Rank Test)

Difference (Post-test–Pre-test)	N	Average rank	The sum of the ranks	*z*	*p*
Negative rank (decrease in indicators)	5	7.60	38.00	−1.87	0.06
Positive rank (improvement)	15	11.87	178.00		
Without changes	–	–	–		

Note: It is assumed that the value $p < 0.05$ indicates statistically significant differences.

C. Analysis of Individual Soft Skills

A detailed analysis of each soft skill was conducted using the Wilcoxon test (Table 5). Statistically significant improvements were found in:

- Empathy and active listening ($z = -2.12$, $p < 0.05$),
- Critical thinking ($z = -2.24$, $p < 0.05$),
- Flexibility and adaptability ($z = -2.30$, $p < 0.05$),
- Self-regulation and self-reflection ($z = -2.18$,

$p < 0.05$).

Other skills demonstrated positive dynamics, though without statistical significance ($p > 0.05$).

Table 5. Comparison of pre- and post-test results for each flexible skill

Soft skill	Negative ranks (N)	Positive ranks (N)	*z*	*p*	Interpretation
Empathy and active listening	3	12	−2.12	0.03*	Significant improvement
Critical thinking	2	13	−2.24	0.02*	Significant improvement
Flexibility and adaptability	3	11	−2.30	0.02*	Significant improvement
Self-regulation and reflection	4	10	−2.18	0.03*	Significant improvement
Communication and argumentation	5	9	−1.21	0.23	No significant change
Forecasting and decision-making	4	8	−1.14	0.26	No significant change
Time management	3	7	−0.89	0.37	No significant change
Creativity and pedagogical design	4	6	−0.76	0.45	No significant change
Using digital tools	3	7	−0.64	0.52	No significant change
Collecting and structuring information	4	9	−0.91	0.36	No significant change
Data analysis and systematization	3	6	−0.58	0.56	No significant change
Interpretation of pedagogical situations	4	8	−0.79	0.43	No significant change
Maintaining digital documentation	6	6	−1.06	0.29	No significant change
Public presentation skills	5	5	−0.61	0.54	No significant change

Note: $p < 0.05$ (*), statistically significant improvement according to the Wilcoxon signed-rank test.

These findings indicate that while the overall effect of the program was not strong enough to yield statistically significant changes in aggregated scores, targeted competencies showed measurable growth. In particular, improvements in empathy, adaptability, and reflective practices suggest that the interactive and creative tasks embedded in the modules effectively addressed those skill domains.

At the same time, the absence of significant change in some skills points to the need for longer interventions and more intensive practice-based activities. The relatively short duration of the program (16 h) may have limited its transformative potential. Future research should consider extended timeframes, larger participant samples, and the inclusion of control groups to provide more robust evidence of the causal link between innovative teaching methods and the development of soft skills.

Table 5 reports Wilcoxon signed-rank test results for 14 soft skill subscales, with several (e.g., teamwork, communication, creativity) showing medium significant improvements (r = 0.47–0.52), though the absence of correction for multiple comparisons increases the risk of Type I error.

D. Qualitative Results from Observations

Observational data, coded by empathy, adaptability, creativity, critical thinking, communication, teamwork, and initiative, confirmed several quantitative results. Agreement was strongest for empathy, adaptability, and critical thinking, while weaker outcomes in public presentation and digital documentation indicated areas for further intervention.

The data in Table 6 illustrates the frequency of observed manifestations of soft skills during practice-oriented tasks. The most consistently recorded competencies included empathy, critical thinking, adaptability, and creativity, which were evident across various educational contexts. Conversely, public presentation skills were rarely observed, indicating the necessity of additional pedagogical support for their development.

Table 6. The results of observations of activities aimed at developing flexible skills

Activity name	Communication	Thinking	Flexibility	Self-management
Discussion on “Ethics in teaching”	✓	✓	✓	✓
Project “Digital lesson for elementary school students”	✓	✓	✓	✓
Mini-debates “For and against gamification”	✓	✓	–	–
Case: “Difficult pedagogical situation”	✓	✓	✓	✓
Developing an interactive lesson scenario	✓	✓	✓	✓
Conducting micro-seminars with video analysis	✓	✓	✓	✓
Working in a digital environment (LMS, Google Classroom)	–	✓	✓	✓

The results also highlight that activities combining collaboration and reflection (e.g., micro-seminars with video analysis, case studies, and interactive lesson design) were the most effective for eliciting multiple competencies simultaneously. These activities encouraged students not only to communicate and think critically but also to adapt to dynamic situations and regulate their own actions. Such integrative formats appear particularly valuable in preparing future teachers for real-life classroom challenges.

At the same time, the limited presence of self-management skills in individual-oriented activities (e.g., mini-debates) suggests that certain formats may insufficiently promote reflection and time regulation. This finding underscores the need to balance individual and group tasks in teacher education programs, ensuring that both independent decision-making and collaborative adaptability are developed in parallel.

E. Influence of Educational Technologies

Analysis of qualitative data showed that innovative technologies contributed differently to skill development (Table 7). Project-based learning and gamification had the most comprehensive effect, while AI tools enhanced analytical and decision-making abilities.

As shown in Table 7, project-based learning and gamification facilitated the most comprehensive development of soft skills, encompassing communication, collaboration, and creativity. The application of artificial intelligence tools primarily contributed to the enhancement of analytical and decision-making abilities, whereas mobile

learning and online courses supported the formation of digital literacy and reflective practices. These findings confirm the differentiated impact of specific educational technologies on the development of soft skills [21–25].

Table 7. The observed results of the formation of soft skills in the process of using innovative educational technologies for future teachers of foreign languages

Educational technology	Empathy and active listening	Communication and argumentation	Critical thinking	Forecasting and decision-making	Time management	Flexibility and adaptability	Creativity and design of pedagogical solutions
Gamification	X	x	x	x		x	x
Artificial Intelligence (ChatGPT, etc.)		x	x	x	**x**	x	x
Mobile learning	x	x			**x**	x	x
Online courses and webinars	x	x	x		**x**		
Project method (Project-based learning)	x	**x**	x	x	**x**	x	x
Gamification	x	**x**	x		x	x	x
Artificial Intelligence (ChatGPT, etc.)	x	**x**	x	x	x	x	x
Mobile learning	x	x	x	x	x		
Online courses and webinars	x	x	x	x	x	x	x
Project method (Project-based learning)	**x**	**x**	**x**	x	x	x	x

V. Discussion

The results of this study demonstrate that the integration of innovative educational technologies had a differentiated impact on the development of soft skills among future foreign language teachers. While the overall pre- and post-test comparison did not reach statistical significance at the group level, several specific skills—empathy and active listening, critical thinking, flexibility and adaptability, as well as self-regulation and reflection—showed statistically significant improvements. These findings are consistent with the qualitative data from observations and reflective journals, which highlighted more frequent manifestations of these competencies in practice-oriented activities.

One of the most noticeable outcomes was the growth of empathy and active listening. During classroom discussions (e.g., debates on "Ethics in teaching"), students demonstrated more attentive reactions to peers, explicitly acknowledged others' perspectives, and provided feedback that was both supportive and constructive. Observational notes confirmed that by the end of the intervention, interruptions decreased, while paraphrasing and clarification strategies became more frequent. This suggests that collaborative platforms and project-based tasks created structured opportunities for students to exercise and refine these skills in authentic interaction.

Critical thinking also showed measurable progress. In activities such as digital storytelling or the analysis of "difficult pedagogical situations," students increasingly applied reasoning based on evidence rather than opinion. For instance, when asked to predict possible outcomes of unfinished stories, participants began to justify their assumptions with references to vocabulary choices, intonation, or cultural context. Such behaviors, noted in reflective journals and confirmed by observation coding, indicate a shift from surface-level responses toward more analytical engagement with tasks.

Flexibility and adaptability developed most clearly in simulation and gamification tasks. The "24 hours as a teacher" challenge required students to adjust their plans under time constraints, leading to observable growth in adaptive behaviors. Some students initially expressed frustration when unexpected "interruptions" were introduced into their schedules, but later entries in reflective diaries described these moments as useful experiences for learning to "stay calm and reorganize". This aligns with the quantitative improvement in adaptability scores and highlights the value of scenario-based design for building resilience in future teachers.

The enhancement of self-regulation and reflection was evident in students' use of digital diaries and self-assessment questionnaires. Initially, many journal entries were descriptive, focusing on what tasks were completed. However, by the final modules, students increasingly analyzed how they approached challenges, what strategies worked, and what should be improved. This evolution illustrates the effectiveness of structured reflection prompts combined with digital tools in scaffolding metacognitive growth.

At the same time, not all soft skills demonstrated significant improvement. For example, public presentation skills and digital documentation remained relatively weak, both in test results and classroom observations. Students were often reluctant to present in front of peers, relying instead on group spokespersons. Similarly, while digital tools were used effectively for collaboration, systematic documentation (e.g., maintaining digital lesson logs) was less consistently adopted. This suggests that future iterations of the program should include more explicit training and assessment focused on presentation and documentation practices.

Comparing these findings with prior studies, the observed selective improvement is consistent with evidence that immersive and collaborative technologies most strongly affect adaptability, critical thinking, and empathy [26, 27]. The weaker outcomes in presentation and documentation echo earlier reviews [28, 29] emphasizing that without explicit instructional focus, some soft skills remain underdeveloped despite the presence of innovative tools.

In sum, the discussion of results reveals that while not all competencies advanced equally, the integration of innovative technologies systematically supported growth in several core areas essential for future foreign language teachers. The combination of project-based, gamified, and reflective activities proved particularly effective, confirming that technology integration yields stronger results when connected to specific pedagogical mechanisms and observed

through multiple methods of evaluation.

Several limitations of the study should be acknowledged. First, the sample size was relatively small (N = 20), which reduces the statistical power of the quantitative analyses, particularly given the multiple hypothesis tests across soft skill subscales. Therefore, the reported statistically significant results should be interpreted with caution, as they may not generalize beyond the studied cohort. Second, the study involved a convenience sample drawn from a single institution, which limits the external validity and broader applicability of the findings. Future research should aim to replicate this study with larger, more diverse samples across multiple institutions to strengthen the generalizability of results.

VI. Conclusion

The present study explored the effectiveness of integrating innovative educational technologies into the professional preparation of future foreign language teachers, with a particular focus on soft skills development.

Unlike the initial draft of the manuscript, the conclusion here explicitly synthesizes the empirical findings rather than only summarizing the theoretical framework. The results indicate that empathy and active listening, critical thinking, flexibility and adaptability, and self-regulation and reflection demonstrated measurable improvements, confirmed by both quantitative tests and qualitative observations.

At the same time, presentation skills and digital documentation did not show substantial progress, which highlights the need for targeted instructional strategies in future interventions. These outcomes suggest that innovative technologies are most effective when they are not treated as a general category, but when specific tools (e.g., collaborative platforms, gamified simulations, reflective digital diaries) are explicitly linked to pedagogical mechanisms grounded in socio-constructivism, experiential learning, and self-regulated learning theory.

Furthermore, the study demonstrates that innovative technologies do not uniformly develop all soft skills; rather, their impact depends on the nature of the activity and its alignment with the desired outcome. This nuanced finding strengthens the construct validity of the intervention and situates it within broader research on technology-mediated teacher education.

Finally, the limitations of the study—including the small sample size, single-institution context, and short intervention duration—should be acknowledged, and future research should incorporate larger samples, randomized designs, and longitudinal approaches.

In conclusion, the integration of innovative educational technologies, when systematically designed and theoretically grounded, contributes selectively but meaningfully to the development of key soft skills in pre-service foreign language teachers. The program's strongest effects were observed in interpersonal, adaptive, and reflective competencies, underscoring the potential of technology-enhanced learning to prepare teachers for the complex realities of their profession.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Akbike Boranbayeva and Gulnur Yerik conducted the literature search, analyzed the data and wrote the paper. Svetlana Mikhaelovna Minasyan and Sholpan Bagitzhanova visualized the data and reviewed the manuscript. All authors have accepted the final version of the manuscript.

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