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ENHANCING THE LINGUODIDACTIC POTENCIAL OF PRE-SERVICE PRIMARY SCHOOL TEACHERS THROUGH THE USE OF DIGITAL TOOLS

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Abstract. This research examines the linguodidactic potential of pre-service primary school educators, emphasizing their essential role in enhancing language proficiency, cultivating the knowledge and abilities to integrate digital tools into teaching, and refining pedagogical strategies through the use of such tools. The primary objectives of the study are to delineate the essence and structural components of the linguodidactic potential of pre-service primary school teachers and to assess its dimensions via the application of digital tools. The investigation employed an experimental training, with the Experimental Group (EG) utilizing digital tools such as Kahoot! Quizlet, Duolingo, Flipgrid and Rosetta Stone, while the Control Group (CG) followed conventional teaching methods. Post-test data indicated substantial improvements in all three dimensions for the EG, particularly in language proficiency, the integration of digital tools, and pedagogical strategies, in contrast to the more modest advancements observed in the CG. These findings underscore the significant impact of digital tools in cultivating key professional competences of future educators, stressing the importance of their inclusion in teacher training curricula. The study also highlights the increasing importance of digital literacy in education and calls for further exploration of the long-term effects and challenges associated with the integration of digital tools in teacher education on a wider scale.

Key words: linguodidactic potential, dimensions, digital tools, pre-service primary school teachers, experimental training, pre- and post- tests, Likert scale, t-test

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ЦИФРЛЫҚ ҚҰРАЛДАРДЫ ПАЙДАЛАНУ АРҚЫЛЫ БОЛАШАҚ БАСТАУЫШ МЕКТЕП МҰҒАЛІМДЕРІНІҢ ЛИНГВОДИДАКТИКАЛЫҚ ӘЛЕУЕТІН АРТТЫРУ

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Аннотация. Бұл зерттеуде болашақ бастауыш сынып мұғалімдерінің лингводидактикалық әлеуетін цифрлық құралдарды кіріктіру арқылы арттыру мәселесі қарастырылады. Цифрлық құралдарды пайдалануды кіріктірудің педагогикалық стратегияларды жетілдірудегі, тілдік білім берудегі және тілді меңгеру деңгейін арттырудағы маңызды рөлін нақтылайды. Зерттеу жұмысының негізгі мақсаты – болашақ бастауыш сынып мұғалімдерінің лингводидактикалық әлеуетін арттырудың мәні мен құрылымдық құрамдас бөліктерін анықтау және цифрлық құралдарды қолдану арқылы оның өлшемдерін бағалау. Зерттеуде эксперименттік топта (ЭТ) Kahoot! Quizlet, Duolingo, Flipgrid және Rosetta Stone сияқты цифрлық құралдарды пайдалану арқылы тәжірибелік оқыту әдістері, ал бақылау тобында (БТ) дәстүрлі оқыту әдістері қолданылды. Тәжірибелік сынақтан кейін ЭТ деректерінің БТ деректеріне қарағанда барлық үш өлшем бойынша әсіресе, цифрлық құралдарды кіріктіру арқылы тілді меңгеру деңгейінің және педагогикалық стратегиялардың әлдеқайда жақсарғаны байқалды. Бұл нәтижелер болашақ педагогтердің негізгі кәсіби құзыреттіліктерін дамытуға цифрлық құралдардың ықпалын, оларды мұғалімдерді даярлауда оқу бағдарламасына енгізудің маңыздылығын көрсетеді. Сонымен қатар, зерттеуде педагогикалық білім беруде цифрлық сауаттылықтың артып келе жатқан маңызды үрдіс екені атап айтылады. Цифрлық құралдарды білім беру үрдісіне кіріктіруге байланысты туындайтын мәселер әлі де болса кең ауқымда ұзақ мерзімді зерттеуді талап етеді.

Түйін сөздер: лингводидактикалық әлеует, өлшемдер, цифрлық құралдар, бастауыш сынып мұғалімдері, эксперименталды дайындық, алдын-ала және кейінгі сынақтар, Лайкерт шкаласы, t-тест.

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ПОВЫШЕНИЕ ЛИНГВОДИДАКТИЧЕСКОГО ПОТЕНЦИАЛА БУДУЩИХ УЧИТЕЛЕЙ НАЧАЛЬНОЙ ШКОЛЫ ПУТЕМ ИСПОЛЬЗОВАНИЯ ЦИФРОВЫХ ИНСТРУМЕНТОВ

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Аннотация. В данном исследовании рассматривается лингводидактический потенциал будущих учителей начальной школы, подчеркивается их важная роль в повышении уровня владения языком, в развитии знаний и умений по интеграции цифровых инструментов в процессе обучения и совершенствования педагогических стратегий посредством использования нужных инструментов. Основными целями исследования являются определение сущности и структурных компонентов лингводидактического потенциала будущих учителей начальной школы и оценка его измерений посредством применения цифровых инструментов. В исследовании использовалось экспериментальное обучение, при этом экспериментальная группа (ЭГ) использовала цифровые инструменты, такие как Kahoot! Quizlet, Duolingo, Flipgrid и Rosetta Stone, в то время как контрольная группа (КГ) следовала традиционным методам обучения. Данные после тестирования показали существенные улучшения по всем трем измерениям для ЭГ, особенно в уровне владения языком, интеграции цифровых инструментов и педагогических стратегий, в отличие от более скромных достижений, наблюдаемых в КГ. Эти результаты подчеркивают значительное влияние цифровых инструментов на развитие ключевых профессиональных компетенций будущих педагогов, подчеркивая важность их включения в программы подготовки учителей. Исследование также подчеркивает растущую важность цифровой грамотности в образовании и призывает к дальнейшему изучению долгосрочных эффектов и проблем, связанных с интеграцией цифровых инструментов в педагогическое образование в более широком масштабе.

Ключевые слова: лингводидактический потенциал, измерения, цифровые инструменты, будущие учителя начальной школы, экспериментальное обучение, предварительные и последующие тесты, шкала Лайкерт, t-тест.

Inrtoduction. In the modern educational landscape, the rapid advancement of digital technologies has significantly influenced the way knowledge is delivered and acquired (Engelina, et al., 2022; Rakhman, et al., 2024). As educational systems work to adapt to the demands of a rapidly evolving world, there is growing emphasis on incorporating digital tools into the teaching and learning processes (Bates, 2015).

This shift is particularly crucial in the context of preparing pre-service primary school teachers, who should be equipped not only with pedagogical knowledge but also with the digital literacy required to navigate the complexities of modern classrooms (Gui Ying Annie Yang-Heim, et al., 2024). Acquiring these skills is vital for enhancing language teaching effectiveness and ensuring that future educators are well-prepared to meet the challenges of an increasingly digital world (Gee, 2003; Godwin-Jones, 2018).

In Kazakhstan, as part of extensive educational reforms, the focus on improving teacher training through innovative pedagogical methods is central to the national agenda (Wilson, et al., 2013). With the introduction of programs like 6B01306 – "Primary Education in English" and 6B01304 – "Primary Education with Multilingualism", there is an increasing demand to strengthen the linguodidactic potential of future educators.

The concept of "*Linguodidactic potential*" emphasizes the ability of educators to effectively integrate language-teaching methods with digital tools that enhance the learning process. Recent studies have explored this potential, especially in the context of digital learning environments. For instance, Osipova and Bagrova (2021) studied the use of Microsoft Teams applications in teaching English vocabulary. These tools have proven to be highly beneficial from both linguistic and didactic perspectives, as they enable educators to create engaging, interactive learning experiences that facilitate vocabulary acquisition while also improving pedagogical effectiveness.

Sysoev (2008) and Belz & Thorne (2006), who explored the role of internet-based resources in foreign language education, presented another investigation into the linguodidactic potential in contemporary education. Their study introduces a classification of didactic algorithms, such as Hotlist, Web Quest, and Multimedia Scrapbook, which serve to enhance both language learning and cultural awareness. These resources demonstrate how the integration of technology can enrich language instruction and foster a deeper understanding of culture, highlighting the intersection of digital tools and language education.

Linguodidactic potential refers to the ability of educators to integrate language instruction with effective teaching strategies, while also making use of digital tools to facilitate learning. This integration is particularly critical for primary school teachers who are tasked with not only teaching foundational skills but also fostering an environment that promotes lifelong learning and intercultural communication (Kramsch, 1993).

In this context, incorporating digital tools into teacher education has emerged as a fundamental element of training programs for pre-service teachers (Puentedura, 2013). Applications such as Kahoot! Quizlet, Duolingo, Flipgrid, and Rosetta Stone offer significant opportunities to enhance various dimensions of the teaching process (Bicen, 2018; Budi Waluyo, et al., 2021; Loewen, et al., 2019; 2020; Mango, 2021; Freeman, et al., 2023). These tools facilitate access to interactive and engaging resources that contribute to improved educational outcomes and foster more dynamic classroom environments (Johnson, et al., 2016). Through the use of

these technologies, pre-service teachers are afforded the opportunity to experiment with a range of instructional methods designed to accommodate diverse student needs, thereby promoting a more individualized and flexible approach to teaching (Mishra & Koehler, 2006). Furthermore, these digital tools serve as platforms for exploring innovative teaching strategies, including gamification and multimedia-based approaches, thereby empowering teachers to engage students more effectively (Gee, 2007). In addition, they foster collaboration and communication within the classroom, enhancing interaction not only among students but also between students and instructors. This collaborative environment encourages creativity, critical thinking, and independent learning, positioning students as active participants in their educational journeys (Collins, et al., 2009). Consequently, the adoption of these tools is instrumental in equipping pre-service teachers with the skills necessary to navigate and thrive in contemporary educational landscapes (Saavedra, et al., 2012).

The current study seeks to explore the linguodidactic potential of digital tools in the training of pre-service primary school teachers. By examining how these tools contribute to the development of language proficiency, the ability to integrate digital tools into teaching, and the refinement of pedagogical strategies, this *research aims* to provide valuable insights into the effectiveness of technology-enhanced teacher education (Kozhamkulova, et al., 2020). The study also examines the essential role of digital literacy (Nurzhaniva, et al., 2024) in preparing pre-service teachers for the demands of modern educational environments and underscores the need for its inclusion in teacher training curricula (Prensky, 2001).

The objectives of this research are twofold:

to determine the essence and component structure of the linguodidactic potential of pre-service primary school teachers;

to evaluate the impact of digital tools on fostering the linguodidactic potential of pre-service primary school teachers.

Methods and material

Participants

The study was conducted among 1st, 2nd, and 3rd year students of Abai Kazakh National Pedagogical University, specialty «6B013 - Training of teachers without subject specialization» (bachelor's degree). The total number of students in both specialties is 133 (6B01306 - "Primary Education in English" and 6B01304 – "Primary Education with Multilingualism)" were selected for this study using a criterion-based sampling method: 46 participants were first-year students, 43 participants were second-year students and 44 participants were third-year students. All 133 students were randomly divided into two large groups: the Experimental Group (67 participants) and the Control Group (66 participants).

Research Methods

In our study, we employed the *Likert scale* as one of the key instruments for measuring pre-service teachers' perceptions, experiences, and attitudes toward the

integration and effectiveness of digital tools in their education and teaching practices. The Likert scale was chosen due to its ability to provide quantifiable data on a range of variables, allowing us to assess the extent to which pre-service primary school teachers agree or disagree with specific statements related to the use of digital tools in language instruction.

Moreover, we used the *t-test* as a statistical method to compare the *mean scores* of the two groups, enabling us to determine if there were significant differences in their responses between the control group and the experimental group. This test was especially valuable for analyzing the Likert scale data, as it allowed us to identify whether any differences in attitudes, perceptions and experiences related to the use of digital tools in teaching were statistically significant. By using the t-test, we were able to draw valid conclusions about the impact of the intervention on the Experimental group (EG) compared to the Control group (CG).

Materials

For experimental teaching pre-service primary school teachers, we have carefully selected the *Kahoot!, Quizlet, Duolingo, Flipgrid, and Rosetta Stone* apps due to their significant linguodidactic potential in improving language teaching and learning. These tools were chosen not only because they are widely recognized and easy to use but also because they effectively promote a holistic and interactive environment for language acquisition. Each of these apps provides distinct features that support the development of key language skills, including vocabulary and grammar accuracy, speaking fluency, and cultural awareness.

Kahoot! is an interactive, game-based learning platform that enables educators to design engaging quizzes, surveys, and polls, making learning enjoyable and dynamic for students.

Linguodidactic Potential: Kahoot captivates students by making language-learning fun through competitive games. Pre-service teachers can use Kahoot to review vocabulary, grammar, and language comprehension in a dynamic and interactive way. This platform is highly effective for conducting formative assessments and providing instant feedback, allowing teachers to gauge student understanding and reinforce key language concepts in real time.

Quizlet is a digital tool designed for creating and sharing flashcards, quizzes, and study sets, making it an effective resource for supporting language learning.

Linguodidactic Potential: Quizlet is a powerful tool for building vocabulary, practicing grammar, and reinforcing language items. Pre-service teachers can leverage Quizlet to design personalized flashcards and quizzes that align with their teaching Curriculum. Additionally, it supports learning through spaced repetition, helping to improve retention and track progress over time, making it an invaluable resource for both teachers and students.

Duolingo is a language-learning app that employs a gamified approach to teach essential language skills, including vocabulary, grammar, reading, writing, and speaking, in an engaging and interactive way.

Linguodidactic Potential: Duolingo facilitates language acquisition through

engaging, bite-sized lessons that make learning accessible and enjoyable. Pre-service teachers can use Duolingo to enhance language skills and as a supplementary tool for students to practice outside the classroom. Its features, including immediate feedback and progress tracking, help reinforce learning and improve long-term language skills.

Flipgrid is an interactive video discussion platform that allows students to record and share short video responses to prompts or questions provided by their teachers, promoting active engagement and communication.

Linguodidactic Potential: Flipgrid is a digital tool for enhancing speaking skills. Pre-service teachers can use it to assign speaking activities like storytelling or discussing various language topics, giving students opportunities to develop their pronunciation, fluency, and overall communication skills. Furthermore, Flipgrid promotes peer interaction by enabling students to view and respond to each other's videos, fostering collaboration and a sense of community within the learning environment.

Rosetta Stone is a well-known language learning platform that employs immersive techniques to teach languages, focusing on contextual learning and natural language acquisition without relying on translation.

Linguodidactic Potential: Rosetta Stone facilitates language acquisition through contextual learning without the use of translation, helping students develop stronger linguistic intuition. Pre-service teachers can use the platform to enhance their own language proficiency or to adopt its immersion-based and communicative teaching methodologies in their classrooms. This approach encourages a deeper, more natural understanding of the target language, making it an effective tool for fostering comprehensive language skills.

Results and discussion

Before the experiment, we conducted a survey using the *Likert scale* to determine the baseline level of digital tool usage in language teaching. This survey was administered to all students from the 1st to the 3rd year.

We created a series of quotes that generally reflect the significance and attitude of respondents towards the use of digital technologies in the educational process. These quotes were designed to assess pre-service teachers' perceptions, attitudes, and experiences with integrating digital tools into language teaching. Participants were asked to rate their level of agreement with each quote on a 5-point Likert scale: *Strongly agree, Agree, Neutral, Disagree, and Strongly disagree* to gather quantifiable data on their views and experiences (Table 1).

Table 1. Likert Scale Survey Responses on the Use of Digital Tools in Language Teaching for Pre-service Primary School Teachers

#	Quote	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	I regularly incorporate digital tools (such as apps or websites) into language teaching.	34,5%	30,8%	23,3%	9%	2,4%

2	I think digital tools improve the effectiveness of language learning for primary school students.	41,1%	36,2%	20,5%	2.2%	0
3	I am confident in using digital tools to teach language skills (e.g., vocabulary, grammar, speaking, and listening).	26,8%	27,4%	32,5%	10,1%	3,2%
4	I incorporate language learning apps like Kahoot!, Quizlet, Duolingo, Flipgrid, or Rosetta Stone into my teaching practices.	25,6%	33,7%	24,2%	12,7%	3,8%
5	Digital tools assist me in effectively assessing student progress in language learning.	23,4%	27,1%	22,2%	15,3%	12%
6	I believe that digital tools enhance students' language acquisition outside the classroom.	42,6%	34,9%	18,2%	4,3%	0
7	I find it easy to integrate digital tools into my lesson plans and teaching methods.	26,2%	28,2%	25,4%	13,9%	6,3%
8	I believe digital tools play a key role in enhancing students' speaking skills in language learning.	23,3%	24,6%	23,5%	15,7%	12,9%
9	Digital tools are effective in boosting student engagement and motivation during language lessons.	56,7%	40,1%	3,2%	0	0
10	I regularly receive feedback from digital tools on students' language proficiency and learning progress.	23.5%	27,6%	21,1%	19,5%	8,3%
11	I believe that using digital tools encourages collaborative learning among students.	24,6%	22,8%	32,3%	12,7%	7,6%
12	I feel that digital tools are effective in fostering students' cultural awareness through language learning.	17,5%	23,4%	51,8%	4,7%	2,6%

The responses to the first quote, *"I regularly incorporate digital tools (such as apps or websites) into language teaching,"* reveal distinct trends. A substantial proportion of participants, 34.5%, strongly affirmed their regular use of digital tools in language teaching practices, indicating a significant commitment to technology integration. An additional 30.8% agreed, reflecting a similarly positive stance toward the adoption of digital tools. Together, these groups represent 65.3% of respondents, highlighting a majority who acknowledge the importance and utility of digital tools in their instructional approaches. Meanwhile, 23.3% of participants expressed a neutral position, which may suggest variability in their access to digital tools, limited familiarity with their usage, or inconsistent application depending on specific teaching contexts. A smaller segment, comprising 9% who disagreed and 2.4% who strongly disagreed (11.4% in total), reported not regularly incorporating digital tools into their practices. This minority reflects challenges such as insufficient training, restricted access to resources, or hesitancy in adopting new methodologies.

The findings indicate that while most pre-service teachers are incorporating

digital tools into their teaching, a notable portion may require additional support or resources to overcome barriers and fully utilize digital technologies in their professional practice.

The responses to the second quote, *"I think digital tools improve the effectiveness of language learning for primary school students,"* highlight an overwhelmingly positive attitude toward the use of digital tools among participants. A notable 41.1% of respondents strongly agreed that these tools enhance the effectiveness of language learning, indicating strong support for their pedagogical benefits. Additionally, 36.2% agreed, further affirming this positive outlook. Altogether, 77.3% of the participants recognized the value of digital tools in improving language-learning outcomes, reflecting a broad consensus on their effectiveness. In contrast, 20.5% of participants expressed a neutral opinion, indicating uncertainty regarding the specific advantages of digital tools and limited direct experience with their application in primary education. A small minority, 2.2%, disagreed, while no participants strongly disagreed, suggesting that outright skepticism about the efficacy of digital tools in enhancing language learning is minimal.

Overall, the data indicates a strong consensus among pre-service teachers regarding the effectiveness of digital tools in enhancing language learning for primary school students, with only a small proportion expressing uncertainty or disagreement. This underscores the significance of integrating digital tools into teacher training Curricula to reinforce their confidence and deepen their understanding of the potential benefits these tools offer in language instruction.

The responses to the third quote, "*I am confident in using digital tools to teach language skills (e.g., vocabulary, grammar, speaking, and listening)*", reveal a mixed but generally positive outlook on pre-service teachers' confidence in using digital tools. A total of 54.2% of respondents either strongly agreed (26.8%) or agreed (27.4%) with the statement, indicating that just over half of the participants feel confident in incorporating digital tools into their language instruction. This suggests that a majority of pre-service teachers are comfortable with using these tools to support various aspects of language teaching. However, a significant portion, 32.5%, remained neutral, which suggest differences in students' experiences and exposure to digital tools and a lack of sufficient training in effectively using these tools to teach various language skills. Furthermore, 10.1% of respondents disagreed, and 3.2% strongly disagreed, indicating that a small percentage of pre-service teachers feel less confident or encounter obstacles in integrating digital tools into their language teaching practices.

Thus, while the majority of students express confidence in using digital tools for language teaching, a considerable number of participants remain neutral or uncertain, indicating that there is room for further professional development.

The data for the fourth quote, "*I incorporate language learning apps like Kahoot!, Quizlet, Duolingo, Flipgrid, or Rosetta Stone into my teaching practices*," reveals a generally favorable trend in the use of digital tools by pre-service teachers. A total of 59.3% of respondents either strongly agreed (25.6%) or agreed (33.7%) with the

statement, suggesting that the majority of pre-service teachers integrate popular language learning apps into their teaching practices. A notable 24.2% of respondents expressed a neutral stance on the use of language learning apps, reflecting varying degrees of familiarity with these specific tools and disparities in access to necessary resources. In contrast, 12.7% of participants disagreed, and 3.8% strongly disagreed with incorporating these apps into their teaching, indicating that a small group of pre-service teachers does not yet use these digital instruments.

These findings suggest that barriers such as limited exposure, inadequate training, or insufficient technological access may impede the broader adoption of these tools.

The results to the fifth quote "*Digital tools assist me in effectively assessing student progress in language learning*" indicate a mixed view among pre-service teachers regarding the role of digital tools in assessment. A total of 50.5% of participants either strongly agreed (23.4%) or agreed (27.1%) with the quote, indicating that a considerable portion of respondents perceive digital tools as valuable in assessing student progress in language learning. At the same time, 22.2% of respondents expressed a neutral stance, suggesting some uncertainty and variability in their experiences with digital assessment tools. A smaller percentage, 15.3%, disagreed with this statement, while 12% strongly disagreed, implying that there are barriers preventing some teachers from fully utilizing these tools for assessment purposes, as well as the presence of alternative assessment methods.

The responses to the sixth statement, "*I believe that digital tools enhance students' language acquisition outside the classroom*", show a largely favorable perception among pre-service teachers. This highlights the recognition of the positive role digital tools play in supporting language learning outside the formal classroom environment. A combined total of 77.5% of participants either strongly agreed (42.6%) or agreed (34.9%) with the quote, suggesting that the majority of respondents recognize the value of digital tools in supporting students' language acquisition outside traditional educational settings. Furthermore, 18.2% of respondents remained neutral, which could indicate uncertainty or a lack of experience with digital tools in informal language learning contexts. Notably, only 4.3% disagreed with the statement, and no respondents strongly disagreed, pointing to a minimal level of skepticism regarding the effectiveness of digital tools in enhancing language acquisition beyond the classroom.

The data suggests a strong consensus among pre-service teachers about the positive impact of digital tools on language acquisition outside the classroom, with only a small minority expressing neutral or negative views.

The responses to the seventh quote, "*I find it easy to integrate digital tools into my lesson plans and teaching methods*," reflect a generally positive, albeit somewhat varied, outlook on pre-service teachers' ability to incorporate digital tools into their instructional practices. Specifically, 54.4% of participants either strongly agreed (26.2%) or agreed (28.2%) with the statement, suggesting that over half of the respondents find the integration of digital tools into their teaching relatively straightforward. Nevertheless, 25.4% of respondents expressed a neutral stance,

suggesting that some teachers may feel uncertain about consistently utilizing digital tools and might lack clarity on how to effectively apply them in particular teaching contexts. Additionally, a smaller proportion of participants, 13.9%, disagreed with the statement, and 6.3% strongly disagreed, signifying that a notable minority of pre-service teachers encounter difficulties or challenges when attempting to incorporate digital tools into their teaching practices.

The responses to the eighth quote, "*I believe digital tools play a key role in enhancing students' speaking skills in language learning*," reveal a diversity of perspectives among pre-service teachers with a less cohesive view compared to other aspects of digital tool integration. A total of 47.9% of participants either strongly agreed (23.3%) or agreed (24.6%) with the quote, suggesting that nearly half of the respondents perceive digital tools as instrumental in fostering speaking skills. Essentially, these figures reflect a moderate recognition of the potential of technologies to enhance the development of oral speech, particularly through interactive and multimedia applications. A significant portion, 23.5%, expressed neutrality, reflecting ambivalence and limited exposure to tools explicitly aimed at improving speaking skills. This neutral position highlights inconsistencies in the perceived effectiveness of such tools and challenges in their seamless integration into pedagogical practices. Conversely, a total of 28.6% of participants expressed disagreement, with 15.7% disagreeing and 12.9% strongly disagreeing, indicating that a significant minority emphasizes potential issues such as a lack of proper training, perceived shortcomings of modern digital tools and a preference for more traditional, face-to-face methods.

Overall, while a considerable number of pre-service teachers recognize the value of digital tools in enhancing students' speaking skills, the notable levels of neutrality and disagreement indicate the necessity for further investigation into how these tools can be more effectively utilized to foster oral language skills and more seamlessly incorporated into teaching methodologies.

The responses to the ninth quote, "*Digital tools are effective in boosting student engagement and motivation during language lessons*", demonstrate a predominantly positive outlook on the role of digital tools in enhancing student involvement and enthusiasm in language learning. A total of 96.8% of respondents either strongly agreed (56.7%) or agreed (40.1%) with the quote, indicating that the vast majority of pre-service teachers perceive digital tools as valuable for increasing student engagement and motivation. Moreover, the absence of disagreement or strong disagreement among respondents further underscores a solid consensus regarding the positive influence of digital tools in this context.

The high figures obtained further confirm the fact that digital tools are considered effective in making lessons more interactive, dynamic, and engaging for students, which undoubtedly contributes to the creation of a more motivated learning environment.

The responses to the tenth quote, "*I regularly receive feedback from digital tools on students' language proficiency and learning progress*", reveal a fairly high outlook

on the role of digital tools in providing feedback on students' language development. The results showed quite high figures. 23.5% answered "Strongly agree", and 27.6% answered "Agree". Overall, positive responses accounted for 51.1%, which is just over half of the total responses. This fact can be explained. Digital tools are increasingly recognized as valuable resources for tracking and assessing student progress in language learning. However, 21.1% of respondents adopted a neutral stance, implying uncertainty and irregularity in their experiences with using digital tools for providing feedback. Furthermore, a significant portion of students 19.5% expressed disagreement and 8.3% strongly disagreed, demonstrating their inability or lack of confidence in using digital tools for assessment and receiving feedback.

Overall, the results obtained indicate that while many pre-service teachers acknowledge the usefulness of digital tools in monitoring language proficiency, there are still responses from those who either do not use them regularly for feedback or encounter obstacles in leveraging them effectively.

The responses to the eleventh quote "*I believe that using digital tools encourages collaborative learning among students*" reveal a mixed, but somewhat favorable perspective on the role of digital tools in promoting collaboration. A total of 47.4% of participants expressed positive opinions, with 24.6% indicating "Strongly Agree" and 22.8% selecting "Agree". This reflects that pre-service teachers largely regard digital tools as a valuable means for promoting collaborative learning among students. However, 32.3% of respondents maintained a neutral stance. This percentage can be attributed to the participation of first-year students in the survey, who generally lack teaching experience and are only beginning their journey in pedagogy. Consequently, the relatively high proportion of neutral responses reflects the students' uncertainty about how to effectively integrate digital tools into group work or collaborative activities. Additionally, 12.7% of respondents disagreed with the quote, while 7.6% strongly disagreed. Some pre-service teachers view digital tools as ineffective for facilitating group activities in the classroom. Moreover, they argue that rather than promoting teamwork, these tools might actually hinder collaboration and contribute to a sense of disunity among peers.

Thus, the survey results for this quote demonstrated rather inhomogeneous outcomes. While some respondents believe that digital technologies promote collaboration during lessons, others expressed the opposite viewpoint.

The responses to the twelfth quote, "*I feel that digital tools are effective in fostering students' cultural awareness through language learning*" reveal a spectrum of viewpoints, with a substantial portion of pre-service teachers displaying ambivalence or a neutral position. A total of 40.9% of students provided affirmative responses (17.5% strongly agreed and 23.4% agreed), which underscores the recognition of the importance of incorporating authentic digital tools to enhance cultural awareness. This group of respondents expressed confidence in the potential of digital tools to facilitate immersion in the authentic culture of the target language. However, a notable majority of 51.8% of participants remained neutral, suggesting either uncertainty about the efficacy of digital tools in promoting cultural awareness

or insufficient familiarity with how such tools could be utilized for this specific purpose. Additionally, a smaller percentage of respondents, comprising 4.7% who disagreed and 2.6% who strongly disagreed, highlighted a minority who questioned the effectiveness of digital tools for fostering cultural awareness, indicating possible concerns regarding their applicability or limitations in achieving this goal.

Following the Likert survey, which helped us assess students' overall condition and perceptions regarding the use of digital technologies in lessons, we conducted a *Pre-Experimental Test.*

The pre-experiment stage aimed to evaluate the initial Linguodidactic Potential of pre-service primary school teachers in utilizing digital tools.

To assess *Baseline knowledge and skills*, participants completed a pre-test, which included tasks on *Digital Tool Integration, Language Teaching Strategies, and Digital Literacy*.

The pre-test was **semi-structured**, meaning it combined both closed-ended (e.g., multiple-choice, true/false) and open-ended questions (e.g., short essays, reflections). This mix allowed for both quantitative assessment and qualitative insights into the participants' pedagogical thinking and their potential to integrate digital tools into teaching.

The test assessed *Linguodidactic Potential dimensions* as:

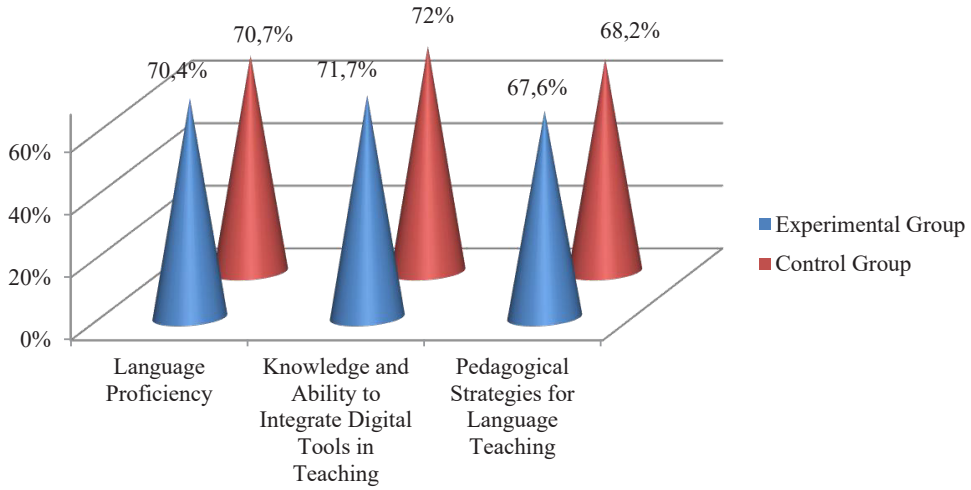
Language Proficiency. This component evaluates participants' language proficiency specifically in the context of teaching. It includes tasks designed to assess their ability to comprehend, produce, and apply language in a teaching setting. The pre-test involves reading and listening comprehension activities, speaking and writing tasks based on teaching scenarios, and assessing grammatical/lexical knowledge. These tasks aimed to verify that participants possess the linguistic and communicative skills needed to effectively deliver lessons and communicate in the classroom, ensuring they are prepared to use language as a tool for teaching primary school students.

Knowledge and Ability to Integrate Digital Tools in Teaching. This section assesses the participants' knowledge of digital tools and their ability to effectively integrate them into language teaching. It includes a combination of multiple-choice questions, scenario-based tasks, and open-ended reflection prompts. The goal is to evaluate participants' familiarity with various digital tools, such as Kahoot!, Quizlet, Duolingo, Flipgrid, Rosetta Stone and to understand how they can apply these tools in real-world teaching contexts. By focusing on practical application, this section gauges participants' readiness to enhance language learning through the strategic use of digital technologies.

Pedagogical Strategies for Language Teaching. This section evaluates participants' understanding of language teaching methodologies and their capacity to implement these strategies in practical contexts. The test features multiple-choice questions on various teaching approaches (e.g., task-based learning), brief essay prompts on specific teaching methods, and reflective questions about adapting these strategies through the use of digital tools.

During the pre-test conducted with the Control and Experimental Groups, the following results were obtained (Fig.1).

Fig. 1 Pre-Test Assessment Results: EG vs.CG



The bar chart presents the pre-test outcomes for the Experimental Group (EG) and Control Group (CG) across three critical dimensions of linguodidactic potential: *Language Proficiency, Knowledge and Ability to Integrate Digital Tools in Teaching, and Pedagogical Strategies for Language Teaching.*

In the domain of *"Language Proficiency"*, the EG achieved a score of 70.4%, while the CG slightly surpassed this with a score of 70.7%. These results indicate that both groups exhibit analogous baseline linguistic competencies pertinent to instructional contexts. Regarding *"Knowledge and Ability to Integrate Digital Tools in Teaching"*, the EG attained a score of 71.7%, closely mirroring the CG's performance of 72%, thereby demonstrating equivalent levels of familiarity with and capacity to employ digital tools effectively in pedagogical scenarios. Finally, within the dimension of *"Pedagogical Strategies for Language Teaching"*, the EG recorded a score of 67.6%, which was marginally lower than the CG's 68.2%, reflecting a comparable foundational understanding of language teaching methodologies in both groups.

In summary, the findings reveal negligible disparities between the two groups across all assessed dimensions, underscoring a balanced baseline for initiating further experimental interventions aimed at evaluating the efficacy of innovative teaching strategies or digital tools in fostering linguodidactic potential.

In addition, we would like to present the results of t-test conducted to compare the pre-test scores of the Experimental Group (EG) and the Control Group (CG) across three dimensions provided in Table 2.

Table 2. T-Test Results for Pre-Test Scores by Dimension

Dimension	t-value	p-value	Interpretation
Language Proficiency	- 0.23	0.82	No significant difference ($p > 0.05$); similar language proficiency between groups.
Knowledge and Ability to Integrate Digital Tools in Teaching	- 0.18	0.86	No significant difference ($p > 0.05$); comparable knowledge and ability to integrate digital tools.
Pedagogical Strategies for Language Teaching	- 0.33	0.74	No significant difference ($p > 0.05$); similar baseline understanding of pedagogical strategies.

The results across all three dimensions indicate *no statistically significant differences* between the EG and the CG at the pre-test stage. The high p-values (all > 0.05 show that both groups were equivalent in terms of their baseline knowledge and skills.

The next stage after analyzing the pre-test results is the **implementation of the experimental intervention.** *The purpose* of implementing the experimental intervention is to determine the effectiveness of digital tools in fostering the linguodidactic potential, in comparison to traditional teaching methods.

The study implemented a structured comparative approach to evaluate the effectiveness of digital tools in language education. The EG engaged in their learning process using advanced *digital tools* specifically designed to enhance language proficiency and teaching strategies. The tools included *Kahoot!, Quizlet, Duolingo, Flipgrid, and Rosetta Stone*, each selected for its unique contribution to interactive and student-centered learning.

In contrast, the CG followed *the traditional teaching methods* prescribed by the Educational Curriculum, which relied primarily on teacher-led instruction, textbooks, and written exercises. The CG's approach emphasized conventional pedagogical strategies, including lectures, grammar drills and structured practice sessions (task-based learning, interactive techniques, problem-solving, discussions) without the integration of digital tools.

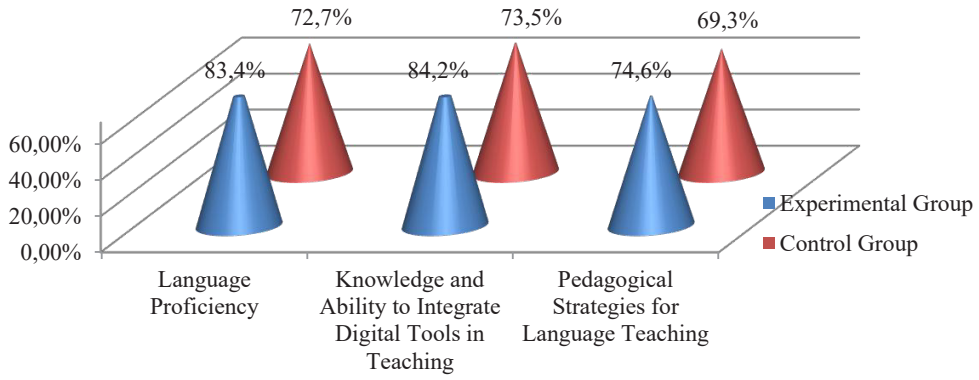
The duration of the experimental intervention spanned a period of six months.

After the experimental intervention, a post-test was conducted in both the EG and CG

The post-test aimed to evaluate the change in Linguodidactic Potential following the intervention, with a focus on assessing the improvement in Language Proficiency, Knowledge and Ability to Integrate Digital Tools in Teaching, and Pedagogical Strategies for Language Teaching. The post-test mirrored the pre-test semi-structured format by including both closed-ended and open-ended questions.

The post-test results indicate a notable improvement in both the EG and the CG, with the EG showing slightly higher post-test scores across all domains, reflecting the effectiveness of the experimental interventions (Fig.2).

Fig. 2 Post-Test Assessment Results: EG vs.CG



The post-test results indicate the following: after the experimental intervention and training, both the Experimental Group (EG) and the Control Group (CG) demonstrated positive changes. However, when comparing the EG, where training was conducted using digital applications, and the CG, where traditional methods based on the Educational Curriculum were employed, the EG achieved significant positive improvements across all three dimensions.

In particular, under the *"Language Proficiency"* dimension, the Experimental Group (EG) demonstrated significant progress across all types of speech activities and lexical-grammatical knowledge, with training conducted using digital applications. In contrast, the Control Group (CG), which followed a traditional format, showed only minor improvements. This is reflected in the results: the EG achieved 83.4%, while the CG reached only 72.7%. For the second dimension, *"Knowledge and Ability to Integrate Digital Tools in Teaching"*, the EG also achieved impressive results compared to the CG. Specifically, the EG reached a score of 84.3%, whereas the CG barely approached 73.5%. Regarding the third criterion, *"Pedagogical Strategies for Language Teaching"*, the EG once again outperformed the CG, with scores of 74.6% and 69.3%, respectively.

Thus, based on the post-test results, we conclude that the experimental intervention, where training in the EG was conducted using digital applications like *Kahoot!, Quizlet, Duolingo, Flipgrid, and Rosetta Stone*, proved significantly more effective than traditional teaching methods. This underscores the high linguodidactic potential of digital tools and provides a positive answers to the research questions posed.

Here are the results of t-test conducted to compare the post-test scores of the Experimental Group (EG) and the Control Group (CG) across three dimensions provided in Table 3.

Table 3. T-Test Results for Post-Test Scores by Dimension

Dimension	t-value	p-value	Interpretation
Language Proficiency	6.21	0.00001	Significant difference ($p < 0.05$); EG showed significantly better language proficiency than CG.
Knowledge and Ability to Integrate Digital Tools in Teaching	6.34	0.00001	Significant difference ($p < 0.05$); EG demonstrated superior integration of digital tools compared to CG.
Pedagogical Strategies for Language Teaching	4.21	0.0001	Significant difference ($p < 0.05$); EG outperformed CG in pedagogical strategies for language teaching.

The T-test results for the post-test scores across the three dimensions reveal statistically significant differences between the Experimental Group (EG) and the Control Group (CG), with the EG showing considerably better outcomes in all areas measured.

In the *"Language Proficiency"* dimension, the Experimental Group (EG) demonstrated a notably higher score of 83.4%, compared to the Control Group (CG), which scored 72.7%. The t-value of 6.21 and the p-value of 0.00001 highlight a significant statistical difference, suggesting that the integration of digital applications in the EG played a crucial role in enhancing language proficiency. The p-value, far below the 0.05 threshold, confirms that this difference is statistically significant.

Similarly, in the *"Knowledge and Ability to Integrate Digital Tools in Teaching"* dimension, the EG outperformed the CG with a post-test score of 84.3%, while the CG achieved only 73.5%. The t-value of 6.34 and p-value of 0.00001 strongly support the substantial effect of digital tools on the EG's capacity to integrate technology into teaching, in contrast to the traditional methods employed by the CG.

In the *"Pedagogical Strategies for Language Teaching"* dimension, the EG again achieved superior results, scoring 74.6%, compared to the CG's 69.3%. The t-value of 4.21 and p-value of 0.0001 indicate a significant improvement in pedagogical strategies in the EG, attributed to the use of digital applications during the intervention.

Overall, the results indicate that the integration of digital tools in the experimental group led to significant improvements across all dimensions. The p-values, all well below the 0.05 significance level, confirm that the differences between the EG and CG are statistically meaningful, highlighting the positive influence of technology-enhanced learning compared to traditional teaching methods. These findings support the high linguodidactic potential of digital apps in improving language teaching outcomes.

The general outcomes of the EG and CG for pre- and post- tests can be presented in a Table 4.

Table 4: Comparative Pre- and Post-Test Outcomes of the Experimental Group (EG) and Control Group (CG)

Dimension	EG Pre-Test	EG Post-Test	Change in EG	CG Pre-Test	CG Post-Test	Change in CG
Language Proficiency	70.4%	83.4%	+13.0%	70.7%	72.7%	+2.0%
Knowledge and Ability to Integrate Digital Tools in Teaching	71.7%	84.3%	+12.6%	72.0%	73.5%	+1.5%
Pedagogical Strategies for Language Teaching	67.6%	74.6%	+7.0%	68.2%	69.3%	+1.1%

Table 4: "*Comparative Post-Test Outcomes of the Experimental Group (EG) and Control Group (CG)*" provides an overview of performance across three key dimensions: Language Proficiency, Knowledge and Ability to Integrate Digital Tools in Teaching, and Pedagogical Strategies for Language Teaching. It compares the pre-test and post-test scores for both groups, indicating the percentage changes achieved after the experimental intervention. In the "*Language Proficiency"* criterion, the EG displayed a marked increase from 70.4% to 83.4%, representing a 13.0% improvement, while the CG exhibited a modest rise from 70.7% to 72.7%, a 2.0% gain. Similarly, the EG made significant progress in "*Knowledge and Ability to Integrate Digital Tools in Teaching*", with scores rising from 71.7% to 84.3%, a 12.6% improvement, in contrast to the CG's modest increase from 72.0% to 73.5%, reflecting a 1.5% gain. For *"Pedagogical Strategies for Language Teaching"*, the EG exhibited minimal change, improving from 67.6% to 74.6%, a 7.0% increase, whereas the CG saw minimal progress, with scores moving from 68.2% to 69.3%, a 1.1% gain.

Overall, the table underscores the substantial positive impact of digital apps on the EG's performance across all criteria compared to the more modest improvements observed in the CG, illustrating the effectiveness of technology-enhanced learning over traditional methods.

Conclusion

This research investigated the linguodidactic potential of pre-service primary school teachers, highlighting their critical role in enhancing language proficiency, integrating knowledge, and refining pedagogical strategies through the use of digital tools. The findings from the experiment reveal that the use of digital applications like *Kahoot!, Quizlet, Duolingo, Flipgrid, and Rosetta Stone* led to significant improvements in the teaching outcomes of the Experimental Group (EG), in contrast to the Control Group (CG), which adhered to conventional teaching methods.

The data reveals significant progress across all three Linguodidactic potential dimensions - *Language Proficiency, Knowledge and Ability to Integrate Digital Tools in Teaching, and Pedagogical Strategies for Language Teaching* - in the Experimental Group (EG). These results emphasize the effectiveness of digital tools in enhancing language abilities, promoting the integration of technology in teaching, and improving pedagogical methods, all of which play a key role in shaping

competent future educators. These results underscore the power of digital tools in fostering language skills, expanding technological integration in teaching, and enhancing pedagogical approaches, ultimately shaping competent future educators.

Additionally, the favorable outcomes seen in the EG's post-test results affirm that the integration of digital tools in teacher training programs is an effective way to prepare pre-service teachers with the necessary skills for contemporary educational settings. The study not only reinforces the importance of digital literacy in education but also suggests that such tools should be further integrated into teacher education curricula to maximize their potential.

The study strongly supports the integration of digital tools into pre-service teacher education, as they serve as a valuable means of developing linguodidactic potential. This approach can result in more engaging and effective teaching practices, ensuring that pre-service primary school educators are equipped to address the evolving demands of students in the digital era.

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