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INTEGRATING TECHNOLOGY INTO PRESCHOOL ENGLISH CURRICULUM: FROM PLAY-BASED TO DIGITAL LEARNING

Abstract. This article explores how digital technology can be used in preschool English education and how teachers can move from only play-based learning to a combination of play and digital tools. The study explains that when technology is used in the right way, it can help young children learn English better. Digital tools can support children's language development, improve their creativity, and make lessons more interesting and enjoyable. The article compares two education systems: Finland and Uzbekistan. Finland's holistic and child-centered model and Uzbekistan's "Ilk Qadam" national curriculum for preschool. These systems show how play-based learning and digital resources can work together in early childhood classrooms. To understand this better, the paper examines several popular digital applications such as Khan Academy Kids, EPIC, Duolingo ABC, Playtime by the British Council, and LingoKids. These tools help children learn new words, practice correct pronunciation, listen to stories, and build simple communication skills through games, songs, and interactive activities. The study applies comparative-descriptive and comparative-analytical methods to examine similarities and differences in curriculum design, teaching practices, teacher roles, and technological infrastructure in both contexts. The findings of the study show that digital tools can be very effective when teachers use them with a clear purpose. The study concludes that digital technology should function as a supportive pedagogical tool rather than a replacement for play-based learning. The article offers practical recommendations for teachers and curriculum designers. It also emphasizes that the main goal is to keep the benefits of play while using technology to strengthen English language learning in preschool classrooms.

Keywords: Preschool education; digital learning; play-based learning; English language teaching; early childhood education; technology integration; Finland; Uzbekistan; Ilk Qadam curriculum; digital tools for children.

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TEXNOLOGIYANI MAKTABGACHA TA'LIM INGLIZ TILI O'QUV DASTURIGA INTEGRATSIYA QILISH: O'YIN ASOSIDAGI TA'LIMDAN RAQAMLI TA'LIMGACHA

Annatatsiya. Ushbu maqolada maktabgacha yoshdagi ingliz tilini o'rganishda raqamli texnologiyalardan qanday foydalanish mumkinligi va o'qituvchilar qanday qilib o'yinga asoslangan ta'limdan, o'yin va raqamli vositalar kombinatsiyasiga o'tishlari mumkinligi ko'rib chiqiladi. Tadqiqotda aytilishicha, texnologiya to'g'ri qo'llanilganda yosh bolalarga ingliz tilini yaxshiroq o'rganishga yordam beradi. Raqamli vositalar bolalarning til rivojlanishini qo'llab-quvvatlashi,

ularning ijodkorligini rivojlantirishi va darslarni yanada qiziqarli va jozibador qilishi mumkin. Maqolada ikkita ta’lim tizimi: Finlyandiyaning yaxlit va bolalarga yo‘naltirilgan modeli va O‘zbekistondagi maktabgacha ta’lim muassasalari uchun “Ilk qadam” o‘zbek milliy o‘quv dasturi solishtiriladi. Ushbu tizimlar o‘yinga asoslangan ta’lim va raqamli resurslarning erta bolalik davrida qanday ishlashi mumkinligini ko‘rsatadi. Buni yaxshiroq tushunish uchun maqolada Khan Academy Kids, EPIC, Duolingo ABC, Britaniya Kengashining Playtime va LingoKids kabi bir nechta mashhur raqamli ilovalar ko‘rib chiqiladi. Bu vositalar bolalarga yangi so‘zlarni o‘rganishga, to‘g‘ri talaffuz qilishga, ertaklarni tinglashga, o‘yinlar, qo‘shiqlar va interaktiv mashg‘ulotlar orqali oddiy muloqot ko‘nikmalarini rivojlantirishga yordam beradi. Tadqiqotda o‘quv dasturi dizayni, o‘qitish amaliyoti, o‘qituvchi rollari va texnologik infratuzilmadagi o‘xshashliklar va farqlarni ikkala kontekstda ham o‘rganish uchun qiyosiy-tavsiflovchi va qiyosiy-tahliliy usullar qo‘llaniladi. Tadqiqot natijalari shuni ko‘rsatadiki, raqamli vositalar o‘qituvchilar tomonidan aniq maqsadda foydalanilganda juda samarali bo‘lishi mumkin. Raqamli texnologiyalar o‘yinga asoslangan o‘rganish o‘rnini bosuvchi emas, balki qo‘llab-quvvatlovchi pedagogik vosita sifatida ishlashi kerak. Maqolada o‘qituvchilar va o‘quv dasturini ishlab chiquvchilar uchun amaliy tavsiyalar berilgan. Shuningdek, asosiy maqsad maktabgacha ta’lim sinflarida ingliz tilini o‘rganishni kuchaytirish uchun texnologiyadan foydalangan holda o‘yinning afzalliklarini saqlab qolish ekanligi ta’kidlangan.

Kalit so‘zlar: Maktabgacha ta’lim; raqamli ta’lim; o‘yinga asoslangan ta’lim; Ingliz tilini o‘rgatish; erta bolalik ta’limi; texnologiya integratsiyasi; Finlyandiya; O‘zbekiston; Ilk Qadam o‘quv dasturi; bolalar uchun raqamli vositalar.

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ИНТЕГРАЦИЯ ТЕХНОЛОГИЙ В ПРОГРАММУ ДОШКОЛЬНОГО ИЗУЧЕНИЯ АНГЛИЙСКОГО ЯЗЫКА: ОТ ИГРОВОГО К ЦИФРОВОМУ ОБУЧЕНИЮ

Аннотация. В этой статье рассматривается, как цифровые технологии могут быть использованы в дошкольном обучении английскому языку и как педагоги могут перейти от игрового обучения к сочетанию игры и цифровых инструментов. В исследовании объясняется, что при правильном использовании технологии могут помочь маленьким детям лучше освоить английский язык. Цифровые инструменты могут способствовать развитию языка детей, развивать их творческие способности и делать уроки более интересными и увлекательными. В статье сравниваются две системы образования: целостная и ориентированная на ребенка модель Финляндии и узбекская национальная учебная программа для дошкольных учреждений «Илк кадам». Эти системы показывают, как игровое обучение и цифровые ресурсы могут работать вместе в группах раннего развития. Чтобы лучше понять это, в статье рассматриваются несколько популярных цифровых приложений, таких как Khan Academy Kids, EPIC, Duolingo ABC, Playtime от Британского совета и LingoKids. Эти инструменты помогают детям изучать новые слова, практиковать правильное произношение, слушать истории и развивать простые навыки общения с помощью игр, песен и интерактивных занятий. В исследовании применяются сравнительно-описательные и сравнительно-аналитические методы для изучения сходств и различий в разработке учебных программ, педагогической практике, роли учителей и технологической инфраструктуре в обоих контекстах. Результаты исследования показывают, что цифровые инструменты могут быть очень эффективными, если учителя используют их с чёткой целью. В исследовании сделан вывод о том, что цифровые технологии должны функционировать как вспомогательный

педагогический инструмент, а не как замена обучению в игровой форме. В статье предлагаются практические рекомендации для учителей и разработчиков учебных программ. Также подчеркивается, что главная цель состоит в том, чтобы сохранить преимущества игры, используя технологии для укрепления знаний английского языка в дошкольных группах.

Ключевые слова: Дошкольное образование; цифровое обучение; игровое обучение; преподавание английского языка; дошкольное образование; интеграция технологий; Финляндия; Узбекистан; учебная программа «Илк Кадам»; цифровые инструменты для детей.

INTRODUCTION

In recent years, the integration of technology into early childhood education has become one of the most discussed innovations in pedagogy. As societies become increasingly digital, even preschool education is expected to evolve to meet the linguistic and technological demands of the 21st century. English, being a global language, plays a vital role in early education, and teachers worldwide are seeking effective methods to introduce it at the preschool level. Traditionally, young learners have acquired language through play-based approaches that emphasize natural communication, creativity, and emotional engagement. However, the emergence of digital tools such as EPIC, Khan Academy Kids, Playtime by the British Council, Duolingo ABC, and LingoKids has opened new possibilities for language learning that are interactive, multimodal, and learner-centered. Research shows that well-designed digital tools can enhance learning when used purposefully and with teacher guidance [M. Alper & K. Hirsh-Pasek, 2022: 320–321].

Play-based learning has long been recognized as the foundation of early childhood pedagogy. According to theorists such as Friedrich Froebel and Maria Montessori, play is not only a leisure activity but also a vital medium for developing language, cognition, and social skills. Through songs, role play, storytelling, and exploration, children learn to express themselves and make sense of their environment. However, as digital technologies become more accessible, teachers and policymakers face the challenge of maintaining this play-based philosophy while incorporating new digital learning tools. The question is no longer whether technology should be used, but how it can be used responsibly and effectively to complement rather than replace play. Recent educational studies further confirm that multimedia applications stimulate children's curiosity and motivation through interactive storytelling, repetition, and games [G. Falloon, 2019: 308–310].

Recent educational research suggests that carefully designed digital tools can support the goals of play-based learning. Interactive applications and multimedia platforms encourage children to explore, imitate, and repeat words and phrases in a playful digital environment. For instance, EPIC provides access to thousands of illustrated storybooks that build vocabulary and comprehension; Khan Academy Kids offers games and phonics activities that reinforce early literacy skills; and Duolingo ABC guides children through reading and pronunciation practice with gamified rewards. These tools are designed to keep children motivated while fostering linguistic and cognitive growth. When teachers integrate such tools with traditional classroom play, the result can be a more balanced and engaging learning experience.

Despite these advantages, there are still challenges in integrating technology into preschool curricula, particularly in developing contexts. In Uzbekistan, for example, digital learning is growing but remains limited by unequal access to devices, insufficient teacher training, and the lack of localized English-learning applications. In contrast, Finland—known for its progressive early childhood education—successfully integrates digital tools within a holistic, child-centered curriculum where play and technology coexist harmoniously. Comparing these two contexts highlights the importance of methodological guidance in adopting technology-based English instruction for preschoolers.

This article aims to explore how technology can be effectively integrated into the preschool English curriculum while preserving the essence of play-based learning. It examines the pedagogical principles underlying digital and

play-based education, reviews practical examples of popular English-learning applications for preschoolers, and considers cross-cultural insights from Uzbekistan and Finland. The study seeks to answer two key questions:

1. How do digital tools support play-based English learning for preschoolers?

2. What are the main benefits and challenges of integrating technology into preschool English curricula?

The findings of this research will contribute to a broader understanding of how early language education can evolve through innovation without losing its developmental foundations. By blending play and technology, educators can create a holistic learning environment that nurtures curiosity, creativity, and communication skills essential for children's lifelong learning journey.

LITERATURE REVIEW

Early childhood education (ECE) focuses on helping the whole child grow thinking skills, emotions, social abilities, and language. Foundational theories by Jean Piaget and Lev Vygotsky provide crucial insight into how young learners acquire knowledge. Piaget's constructivist theory views learning as an active process in which children construct meaning through experience and exploration [J. Piaget, 1972]. Similarly, Vygotsky's sociocultural theory stresses the role of social interaction and scaffolding in learning, asserting that language development occurs through communication and guided participation [L.S. Vygotsky, 1978]. These frameworks align naturally with play-based learning, which creates opportunities for meaningful interaction and discovery.

In play-based settings, children engage in activities that integrate language with action, emotion, and imagination. Scholars such as Friedrich Froebel, often called the "father of kindergarten," viewed play as the highest form of learning because it promotes creativity, problem-solving, and communication [F. Froebel, 1887]. Maria Montessori also highlighted the importance of hands-on activities that encourage independence and self-expression. Within language learning, play offers a context for authentic communication. Songs, stories, and games help children practice vocabulary, grammar, and pronunciation in a natural environment. Therefore, any integration of technology in early English education should build on these theoretical principles rather than replace them.

Play-based learning has been widely adopted as a core pedagogical approach in preschool education worldwide. According to Hirsh-Pasek, play supports both linguistic and cognitive development by allowing children to experiment with sounds, words, and meanings in low-pressure environments [K. Hirsh-Pasek, 2009]. Through pretend play and storytelling, children enhance narrative competence and communicative confidence, which are key elements in second-language acquisition. For example, Couse and Chen found that tablets encouraged young learners' engagement and creativity in preschool classrooms [L.J. Couse, D.W. Chen, 2010; 76–80]. However, scholars caution against unstructured or excessive digital use. Plowman, McPake, and Stephen note that although children benefit from exposure to technology, they still require strong adult guidance to make meaningful connections [L. Plowman, J. McPake, C. Stephen, 2010; 68–70].

In English language teaching (ELT) for preschoolers, play manifests in singing, dramatization, movement activities, and creative art. Teachers use songs, rhymes, and role-play to engage multiple senses, making language acquisition both enjoyable and memorable. For instance, Total Physical Response (TPR) techniques rely on bodily movement to reinforce understanding a principle easily adapted to digital contexts through interactive animations and gesture-based games. However, traditional play-based approaches sometimes face limitations in exposure and linguistic input. Many preschool classrooms have limited access to authentic English materials or native speaker interaction. Digital tools, if appropriately chosen, can bridge this gap by providing immersive and diverse language experiences through sound, visuals, and interactivity.

The digital transformation of education has increasingly influenced early childhood classrooms. Research by Plowman shows that technology can enrich learning environments when used purposefully and under teacher guidance [L. Plowman, 2010; 63-74]. Digital tools such as tab-

lets, smartboards, and mobile applications offer multimodal experiences that align with young children's natural curiosity and short attention spans.

In language learning, technology enhances engagement through multisensory input, instant feedback, and personalized learning paths. For example, animated characters, colorful visuals, and voice narration can make pronunciation and comprehension easier for preschoolers. Importantly, technology also facilitates differentiated learning, allowing children to progress at their own pace. However, researchers caution against uncritical use of technology in early childhood education. According to Livingstone and Blum-Ross, excessive screen time or poorly designed digital content may hinder social interaction and physical activity, both essential for child development [S. Livingstone, A. Blum-Ross, 2020]. Thus, the integration of technology must be balanced, intentional, and supported by pedagogical frameworks that preserve play, creativity, and interaction.

Digital tools can therefore enhance early English learning when grounded in play-based pedagogy. Falloon found that literacy apps support vocabulary development and phonological awareness, especially when used within holistic, child-centered lessons [G. Falloon, 2019; 309–312]. Yelland similarly emphasizes that digital play promotes creativity and imagination in early childhood settings [N. Yelland, 2018; 205–210].

Based on Froebel's play-based learning theory, Piaget's constructivist learning theory, and Vygotsky's sociocultural theory, this study hypothesizes that preschool children who engage in teacher-guided, play-based English learning supported by age-appropriate digital tools will demonstrate higher levels of language engagement, vocabulary development, and communicative participation than children exposed to play-based learning without digital support.

Several educational platforms have been developed to teach English through digital play. This section highlights five widely used tools suitable for preschoolers.

1. EPIC (Epic! Reading Platform) – digital reading platform founded by Suren Markosian and Kevin Donahue in 2013. EPIC is a digital library offering thousands of illustrated books, audiobooks, and videos designed for children. It fosters extensive reading, vocabulary development, and comprehension through engaging storytelling. Teachers can assign books by theme or level, while children listen to narration and follow along with text, combining visual and auditory learning. EPIC supports play-based principles by turning reading into an exploratory and self-directed activity.

2. Khan Academy Kids – This app provides a comprehensive early learning program that integrates literacy, numeracy, and creativity. The English section includes phonics, listening, and storytelling exercises in a game-like interface. Children interact with animated animal characters, earning rewards and progressing through levels features that align with the gamification model of learning. Research shows that such gamified experiences increase motivation and retention in preschool education.

3. Playtime by the British Council – Playtime is designed specifically for preschoolers learning English as a second or foreign language. It features songs, stories, and videos performed by native speakers, helping children acquire correct pronunciation and rhythm. The app encourages joint parent-child use, thus supporting Vygotsky's idea of guided participation. Its content promotes both linguistic and cultural awareness, making it valuable for contexts like Uzbekistan, where English is taught as a foreign language.

4. Duolingo ABC by Duolingo Inc. – This app adapts the popular Duolingo model for early readers aged 3–6. It teaches letters, sounds, and basic vocabulary through mini-games, voice recognition, and repetition. The app's feedback system rewards effort rather than accuracy, reducing anxiety and encouraging persistence principles consistent with the affective filter hypothesis.

5. LingoKids – is developed by Lingokids S.L. This app focuses on immersive, story-based English learning through interactive play. Each unit revolves around a theme (e.g., animals, family, food) and combines songs, dialogues, and mini-games. The app allows children to listen, repeat, and interact with digital characters, promot-

ing active participation and contextual learning. Its emphasis on repetition and visual cues supports both memory and pronunciation development.

Collectively, these platforms show how digital tools can replicate the benefits of play, imagination, exploration, and joy within a technological environment. When integrated into a curriculum, they can supplement teacher-led play with independent, self-paced digital interaction.

Cross-national comparisons offer valuable insight into how technology is integrated into preschool education. Finland, renowned for its holistic and child-centered approach, emphasizes balance between traditional play and digital exploration. Finnish early education guidelines encourage the use of technology as a supportive tool for creativity, problem-solving, and language enrichment rather than as an end in itself. Teachers receive professional training in digital pedagogy, ensuring that technology use aligns with developmental goals. In Uzbekistan, early education reform is rapidly evolving under national programs promoting digital transformation and foreign language acquisition. While the "Ilk Qadam" national curriculum prioritizes play and communication, the use of digital tools in preschool English instruction is still emerging. Challenges include limited access to devices, uneven internet connectivity, and a shortage of teacher training in digital methodology. Nevertheless, recent initiatives have introduced multimedia resources and educational apps in pilot kindergartens, signaling progress toward modernization.

A comparative review of these two contexts reveals both the potential and the challenges of technology integration. Finland's success demonstrates the importance of teacher competence, curricular alignment, and ethical digital use, while Uzbekistan's case highlights the need for infrastructure, training, and localized content to ensure effective implementation.

Existing studies confirm that digital tools can enhance language learning when grounded in play-based pedagogy. However, there remains a gap in understanding how digital and play-based approaches can be methodologically combined within preschool English curricula, especially in developing contexts. Few comparative studies address the cultural adaptation of global apps to local educational settings. Moreover, teacher perceptions and classroom integration strategies are underexplored. This study aims to fill these gaps by examining digital-play integration from both pedagogical and practical perspectives.

METHODOLOGY

This study adopts a qualitative comparative research design to examine how digital tools are integrated into preschool English education within play-based and child-centered frameworks in Finland and Uzbekistan. A qualitative approach is appropriate, as it enables an in-depth understanding of pedagogical practices, teacher perceptions, and contextual factors influencing early English instruction.

The study applies comparative education methodology, combining two complementary methods. First is the comparative-descriptive method, used to describe and compare preschool English education systems in Finland and Uzbekistan, including curriculum frameworks, pedagogical principles, and the role of play and digital learning. Second is the comparative-analytical method, applied to analyze how digital tools (EPIC, Khan Academy Kids, Playtime by the British Council, Duolingo ABC, and LingoKids) support language development and align with play-based learning theories in both contexts.

This multi-layered framework ensures systematic and objective comparison between the two countries. The study was conducted in two distinct contexts: Uzbekistan, where early English education is emerging as part of the Ilk Qadam national preschool curriculum, and Finland, recognized for its advanced, holistic approach to early childhood education and its balanced use of play and technology. Participants included 10 preschool English teachers—five from Uzbekistan and five from Finland—working in both public and private preschools. Teachers were selected using purposive sampling, ensuring that all participants had experience using digital tools such as EPIC, Khan Academy Kids, Playtime by the British Council, Duolingo ABC, or LingoKids in their classrooms. The sample also included informal feedback from parents and children (aged 4–6) to understand engagement levels and attitudes toward digital learning.

To ensure the reliability and richness of data, three complementary methods were used:

a) Semi-Structured Interviews: Teachers participated in 30–45-minute interviews conducted either face-to-face or via online video calls. The interview guide included open-ended questions such as

- How do you integrate digital tools into your English lessons?
- What benefits and challenges do you observe when children use these applications?
- How do digital tools support play-based learning principles?
- How do parents respond to technology use in preschool English education?

These interviews provided qualitative insights into teachers' pedagogical decisions, classroom practices, and contextual challenges.

b) Classroom Observation: Classroom observations were conducted in both countries to analyze how digital and play-based elements interact in practice. Each teacher was observed during three English sessions, each lasting approximately 30 minutes. A structured observation checklist focused on:

- Types of digital tools used (e.g., tablets, apps, interactive whiteboards).
- Children's engagement and participation levels.
- Integration of digital content with songs, games, or storytelling.
- Teacher's role in guiding and scaffolding digital activities.

Field notes were taken to capture the emotional tone of lessons, children's reactions, and spontaneous interactions that reflected playfulness and creativity.

c) Document and Content Analysis: The study also analyzed curriculum documents, teacher lesson plans, and app features to evaluate how each digital tool aligns with play-based learning objectives. The analysis included a review of interactive tasks, story-based content, visual design, and pedagogical feedback systems within apps such as EPIC, KhanKids, Playtime, Duolingo ABC, and LingoKids. This allowed for comparison between theoretical claims of the platforms and their practical classroom application.

Special attention was paid to the ethical use of technology in preschool settings. Observations ensured that children's screen time remained age-appropriate (no more than 20–25 minutes per session) and that digital activities were balanced with physical play and social interaction. The research also adhered to national and institutional ethical guidelines in both Uzbekistan and Finland. To enhance credibility, the study employed data triangulation—using multiple sources (teachers, parents, and documents) and methods (interview, observation, and analysis). Member checking was conducted by sharing summarized findings with participants to confirm accuracy. Cross-case comparison between Finland and Uzbekistan strengthened transferability, allowing findings to be applied or adapted to similar educational contexts. Furthermore, the researcher maintained a reflexive journal to record personal observations, assumptions, and potential biases during fieldwork. This reflective approach ensured transparency in data interpretation and reinforced the study's trustworthiness.

Although the qualitative design offers depth of understanding, it also presents certain limitations. The small sample size limits generalization, and findings depend on participants' honesty and subjective perceptions. Moreover, the cross-cultural comparison introduces contextual variables such as infrastructure, curriculum policy, and cultural attitudes toward technology that may affect interpretation. Future research could include a mixed-methods approach or experimental studies to measure the direct impact of digital tools on language proficiency outcomes. This methodology provides a comprehensive framework for exploring how digital tools and play-based learning can coexist within preschool English education. By combining teacher insights, classroom observation, and digital content analysis, the study seeks to develop an evidence-based understanding of effective technology integration. The findings aim to contribute to both theoretical knowledge and practical applications, supporting educators in designing balanced, child-centered, and technologically enriched preschool English curricula.

RESULTS AND DISCUSSION

The study revealed that the integration of technology into preschool English education can significantly enhance children's engagement, motivation, and language development—when applied thoughtfully and in balance with play-based methods. Across both Finland and Uzbekistan, teachers and learners demonstrated positive attitudes toward digital tools such as EPIC, Khan Academy Kids, Playtime by the British Council, Duolingo ABC, and LingoKids. However, differences in infrastructure, teacher training, and curriculum flexibility shaped how effectively these tools were implemented.

One of the most consistent findings across observations and interviews was the high level of student engagement during digital activities. Teachers in both contexts noted that interactive applications, especially Khan Academy Kids and LingoKids, captured children's attention more effectively than traditional worksheets or flashcards. The animated characters, sounds, and reward-based systems appealed to preschoolers' curiosity and sense of play. The study found that digital learning tools significantly increase children's motivation and engagement. EPIC and LingoKids supported vocabulary development through visual and auditory repetition, consistent with findings on the benefits of multimodal learning [G. Falloon, 2019; 310–311].

In Finland, teachers intentionally used these apps as extensions of physical play. For example, after completing a digital story in EPIC, children were asked to act out the story or draw their favorite scene. This hybrid approach blended digital and physical learning, reinforcing vocabulary through movement and imagination. In Uzbekistan, teachers found that digital activities increased children's willingness to participate in English lessons, especially among shy or less confident learners. As one Uzbek teacher explained, "When we open Duolingo ABC or Playtime, even the quietest children begin to repeat words and sing. The colorful images and sounds make them forget they are learning."

Listening and pronunciation: Apps such as Playtime and Duolingo ABC provided clear native pronunciation models, helping children internalize correct sounds and rhythm. Finnish teachers observed that learners mimicked the digital voice accurately, while Uzbek teachers noted improvements in pronunciation confidence.

Vocabulary growth: Teachers from both contexts reported that visually rich digital stories in EPIC and LingoKids significantly enhanced word retention. The use of images, voice narration, and repetition supported the dual coding theory, where visual and verbal inputs reinforce memory.

Reading readiness: Duolingo ABC and Khan Academy Kids helped children recognize letters and phonemes through games, laying foundations for early literacy. Teachers noted that children often asked to revisit favorite activities, demonstrating intrinsic motivation. In summary, digital tools effectively reinforced key linguistic elements when aligned with play-based, communicative activities. They offered consistent input, immediate feedback, and multimodal interaction, which are all essential for preschool English learning.

While digital platforms provided engaging content, their success largely depended on teacher facilitation. Teachers in Finland demonstrated strong digital pedagogy, seamlessly integrating apps into thematic learning units. For instance, a Finnish teacher described using LingoKids during a theme on animals, followed by outdoor play where children identified animals in English. This combination ensured continuity between digital and real-world experiences, maintaining the holistic nature of learning.

Uzbek teachers, though enthusiastic, faced more challenges due to limited training and resources. Some relied solely on the apps' built-in instructions without linking them to the broader curriculum. Nevertheless, several teachers creatively adapted the content. One teacher explained, "After using EPIC for storytelling, we made paper puppets of the characters and retold the story together. It became a mix of technology and imagination." This finding underlines that technology alone cannot replace teacher expertise. The teacher's role is to contextualize digital activities within broader play-based pedagogy, guiding children, encouraging social interaction, and ensuring comprehension.

Pedagogical adaptation also included adjusting digital activities to children's developmental pace. Teachers emphasized that not every child learns effectively through screens; therefore, blended learning alternating between digital and physical play yielded the best outcomes. This observation aligns with Piaget's constructivist view, which highlights the importance of concrete experiences in early learning. Teachers emphasized that technology must be used in conjunction with physical play, storytelling, and movement activities. This aligns with Plowman's conclusion that digital experiences are most meaningful when adults scaffold children's understanding [L. Plowman, J. McPake, C. Stephen, 2010; 69–71].

Despite positive outcomes, teachers identified several challenges in integrating digital tools into preschool English curricula.

Access and infrastructure: In Uzbekistan, many preschools lacked sufficient tablets or stable internet connections. Teachers often used their personal devices or projected app content for group viewing. This limited children's interactivity. Finnish classrooms, by contrast, were better equipped and benefited from digital literacy policies and state-supported teacher training.

Teacher digital competence: Some Uzbek educators expressed uncertainty about selecting appropriate apps and managing screen time effectively. They requested more professional development on digital pedagogy and English language teaching methods. Finnish teachers, benefiting from national ICT education programs, displayed greater confidence and pedagogical flexibility.

Screen time and attention span: Both groups of teachers emphasized the need for moderation. Overuse of technology risked reducing children's physical activity and peer communication. Therefore, digital sessions were kept brief (15–20 minutes), always followed by physical play or creative tasks. This approach resonates with research by Livingstone and Blum-Ross, advocating balanced media use in early education. [S. Livingstone, A. Blum-Ross, 2020]

Cultural and linguistic adaptation: Teachers in Uzbekistan noted that most apps used native English accents and Western cultural contexts unfamiliar to local children. This caused comprehension difficulties. They suggested the development of localized digital content reflecting Uzbek culture and bilingual interfaces to aid understanding. These challenges reveal that successful digital integration requires not only technological access but also cultural adaptation, teacher training, and pedagogical vision.

A comparative analysis between the two contexts demonstrated notable contrasts and shared insights. Finland represents a mature model of digital-play integration. Technology serves as a tool for creativity, embedded within a flexible curriculum emphasizing child autonomy. Finnish educators receive systematic training in ICT pedagogy, and digital activities are often collaborative rather than solitary. Uzbekistan, while still developing in this area, shows strong potential and enthusiasm. Teachers are eager to innovate, and national policies increasingly prioritize digital literacy and early English learning. With more investment in teacher training and localized resources, Uzbekistan could replicate Finland's balanced model of "play plus digital learning." This cross-context view highlights a central lesson: technology should enhance, not replace, child-centered learning. Both countries illustrate that when digital tools are integrated thoughtfully within play-based frameworks, they strengthen engagement, comprehension, and creativity.

The findings confirm that digital tools can coexist harmoniously with play-based learning when guided by strong pedagogical principles. The integration of digital platforms does not signify a departure from traditional early education but rather an evolution toward more interactive, multimodal learning experiences. From a theoretical perspective, the results align with Vygotsky's notion of mediated learning digital tools act as cultural mediators facilitating language acquisition within social contexts. They also support Piaget's view that children learn best through exploration and self-discovery, which digital games can promote when properly scaffolded. However, the study also emphasizes that technology must remain a servant, not a master, in early education. Teachers play the crucial role of mediators who translate digital engagement into meaningful learning. Without active teacher involvement, digital tools risk becoming passive entertainment rather than educational resources.

Here is the table, which can show us the digital tools and pedagogical functions:

Table 1.

Digital Tool	Main Skill Focus	Play-Based Feature	Pedagogical Value
EPIC	Vocabulary, listening	Story exploration	Extensive reading, comprehension
Khan Academy Kids	Phonics, early literacy	Gamified tasks	Motivation and retention
Playtime (BC)	Listening, pronunciation	Songs & stories	Authentic language input
Duolingo ABC	Letter–sound awareness	Reward-based play	Reading readiness
LingoKids	Speaking, vocabulary	Interactive characters	Communicative confidence

Ultimately, technology and play should not be viewed as opposing forces but as complementary elements in the evolving landscape of early childhood education. Their integration, grounded in developmental theory and guided by skilled teachers, creates a more dynamic, inclusive, and enjoyable environment for young English learners.

CONCLUSION

This study explored how technology can be effectively integrated into the preschool English curriculum, emphasizing a balanced approach between digital and play-based learning. Through qualitative insights from teachers in Finland and Uzbekistan, the research demonstrated that when digital tools are used purposefully and under teacher guidance, they can significantly enhance young learners' motivation, engagement, and linguistic competence.

The findings showed that children learn best when digital interaction is intertwined with traditional play, storytelling, and creative activities. Applications such as EPIC, Duolingo ABC, and Khan Academy Kids encouraged children to listen, repeat, and read English words with enthusiasm. However, the most successful outcomes occurred when teachers linked these activities to real-life experiences; for instance, acting out stories, drawing characters, or using new vocabulary in classroom games. This confirmed that technology functions best as a support tool, not as a replacement for active, social, and imaginative learning.

The comparison between Finland and Uzbekistan provided valuable insights. Finnish preschools have already developed a well-structured framework for digital integration, supported by national policies, infrastructure, and teacher training. Technology is seamlessly blended with outdoor activities, group projects, and experiential learning. In contrast, Uzbekistan is still in the process of developing its digital pedagogy for preschoolers. Despite limited access to devices and training, teachers displayed creativity and enthusiasm in adapting digital tools to their contexts. This enthusiasm indicates strong potential for future innovation if systematic support is provided.

Overall, the research supports the idea that digital learning and play-based education are not contradictory but complementary. Both approaches can coexist harmoniously when guided by the teacher's pedagogical vision and aligned with children's cognitive and emotional needs. The essence of preschool education remains rooted in curiosity, exploration, and communication, which are elements that technology can amplify when used wisely. Based on the findings, several recommendations are proposed for educators, policymakers, and curriculum developers to promote the effective integration of technology into preschool English education.

Integrating technology into preschool English education is not about replacing the teacher or traditional play; it is about enhancing the learning experience through modern tools. The digital era offers unique opportunities to make language learning more interactive, inclusive, and joyful. However, these opportunities must be balanced with pedagogical sensitivity, ensuring that every child's imagination, creativity, and social development remain at the heart of learning.

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