



**Development of a Mobile Application for Preparation for English Exam at Unified
National Testing**

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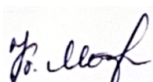
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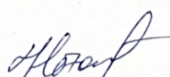
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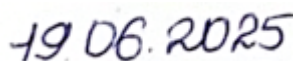
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Development of a Mobile Application for Preparation for English Exam at Unified National Testing

Abstract

This research project focuses on the development and evaluation of BikiUNT, a Telegram-based educational chatbot designed to support high school students in Kazakhstan preparing for the Unified National Testing (UNT) in English. The study aims to address the lack of accessible, localized, and exam-oriented digital resources for learners, particularly in underserved and rural areas. Through a pilot implementation involving 20 students, the study assessed the chatbot's effectiveness in terms of usability, perceived usefulness, motivation, and learning engagement. Key features such as grammar modules, multimedia lessons, diagnostic testing, and gamification were explored. The results indicate high user satisfaction and suggest that BikiUNT can serve as a scalable and cost-effective EdTech solution for exam preparation in the national context.

Keywords: Telegram bot, EdTech, Unified National Testing, English language learning, gamification, chatbot, Kazakhstan

**Ағылшын тілі пәні бойынша Ұлттық бірыңғай тестілеуге (ҰБТ) дайындалуға
арналған мобильді қосымшаны әзірлеу**

Аңдатпа

Бұл зерттеу жұмысы Қазақстандағы мектеп оқушыларына арналған ағылшын тілінен Ұлттық бірыңғай тестілеуге (ҰБТ) дайындайтын WikiUNT Telegram-ботының жасалуына және тиімділігін бағалауға арналған. Зерттеудің басты мақсаты – ауылдық және ресурсы шектеулі аймақтардағы оқушылар үшін қолжетімді, жергілікті жағдайға бейімделген, емтиханға бағытталған сандық ресурстар тапшылығын шешу. Пилоттық кезеңге 20 оқушы қатысып, боттың қолдануға ыңғайлылығы, пайдалығы, мотивациялық әсері мен оқуға тартылуы бағаланды. Грамматика модулі, мультимедиялық сабақтар, диагностикалық тесттер және геймификация элементтері ерекше назарда болды. Нәтижелер оқушылардың жоғары қанағаттану деңгейін көрсетті және WikiUNT ботын ұлттық деңгейде ауқымды әрі тиімді EdTech құралы ретінде қолдануға болатынын дәлелдейді.

Түйінді сөздер: Telegram-бот, білім беру технологиялары, ҰБТ, ағылшын тілін үйрену, геймификация, чат-бот, Қазақстан

Разработка мобильного приложения для подготовки к экзамену по английскому языку на Едином национальном тестировании (ЕНТ)

Аннотация

Данное исследование посвящено разработке и оценке Telegram-бота WikiUNT, предназначенного для подготовки старшеклассников Казахстана к Единому национальному тестированию (ЕНТ) по английскому языку. Целью работы является устранение дефицита доступных, локализованных и ориентированных на экзамен цифровых ресурсов, особенно для учащихся из сельских и малообеспеченных регионов. В пилотном исследовании приняли участие 20 учеников, по результатам которого оценивалась эффективность бота с точки зрения удобства использования, полезности, мотивации и вовлеченности в обучение. Особое внимание уделялось модулям грамматики, мультимедийным материалам, диагностическому тестированию и элементам геймификации. Результаты демонстрируют высокий уровень удовлетворенности пользователей и подтверждают потенциал масштабируемости и практической ценности данного EdTech-решения.

Ключевые слова: Telegram-бот, цифровые технологии в образовании, ЕНТ, обучение английскому языку, геймификация, чат-бот, Казахстан

CHAPTER 1

Introduction

The current education system in Kazakhstan confronts many difficulties, notably English instruction. The population has a language expertise that remains quite low, despite all of the efforts to integrate English into the school curriculum. As indicated by the EF English Skill Index (2023), Kazakhstan ranks 103rd within a total of 113 countries regarding English skill, and that ranking does indicate a need that exists for systemic changes within educational policies as well as approaches that relate to teaching. This is especially true within a country having an acute shortage of qualified English teachers throughout remote plus rural areas. The Ministry of Education and Science of the Republic of Kazakhstan reports that only 20% of teachers, according to reports, have achieved a high professional level (Kazakhstan Ministry of Education, 2021). For teachers, the need within Almaty, Atyrau, Mangistau, and Turkestan regions totaled 1,906 people back in 2021. English teachers totaled 220 within this number (Informburo.kz, 2021). These stats show people working in education face a system issue as they train then distribute, which affects student test prep. The limited teaching load for English is another important obstacle: on average, grades 10–11 are allocated only 2 hours per week. This is equivalent to around 68 hours in each academic year (Adilet.zan.kz, 2022). Meanwhile, according to Cambridge Assessment English (n.d.) and also the Foreign Service Institute (FSI, n.d.), if one wants to achieve the B2 level that is sufficient for passing exams, 500 to 600 hours of study is required, including both independent work and communication. Additional support forms are needed for students to achieve complete preparation (Zou et al., 2021).

1.1 The role of the UNT and difficulties in preparing in English

The Unified National Testing (UNT) is important under these circumstances. It is the most vital element in the case of Kazakhstan's system for education. It is what performs

key functions all at once. First of all, it is mainly the mechanism for selecting applicants to universities. It is in addition the main criterion that is used for distributing state educational grants (Kazakhstan Ministry of Education, 2022). The UNT therefore can be not just only a final assessment, but it is a tool influencing young people's life trajectories. The UNT provides an objective standardized assessment of knowledge that is important given the differences in regional education quality. Research shows that the unified exam influences subjective factors to a minimum and provides equal conditions for applicants from cities and villages (Bainazarov & Kabyrbekov, 2020). Thus, the UNT does serve a certain purpose that exists. Educational opportunities are to be equalized. Furthermore, the presence of the exam acts as a motivating factor because students put more effort into their studies plus schools build programs that take into account the test structure (Zhanbulatova & Nurseitova, 2019). The UNT's role is as a social elevator. A grant is needed by many rural students for higher education. This is often just the only path for them. Centralized examinations in middle-income countries advance social mobility according to UNESCO's 2021 report. They do also help people to access education in an equitable way. Also, UNT data give analytical findings to the Education Ministry, which may tweak school policy and track learning success per area (Kazakhstan Education Statistics, 2022). Modernizing the testing format from 2017 onward involved subjects that are optional being added and a profiling system that was updated in addition to components being introduced for taking into account individual trajectories of students (Nazarbayev Intellectual Schools, 2019). These revisions suggest an effort to keep the exam relevant to current circumstances. The education system in Kazakhstan includes the UNT as a part that is integral. It combines academic assessment, social selection, motivation, and education quality monitoring. It is still a key part of how schools operate. However, this is in spite of the challenges involved with the stress along with preparation associated with it. In this regard, the question does become increasingly important which is how can we help

students to prepare effectively for such an important exam when time and also resources are quite limited?

1.2 The potential of digital technologies and Telegram in education

The education system of Kazakhstan is transforming rapidly in the global digital context. Modern information technologies do increasingly supplement customary teaching methods along new tracks. Mobile applications are trusted for use in the educational environment since they are accessible for students, interactive for all, and able to adapt to the individual characteristics of students. A flexible format to organize the learning process is allowed, especially important for schoolchildren accessing educational services. For learning English, mobile technologies improve students' academic performance. It also shows research improves student independence and engagement (Zou et al., 2021). Their use is helpful for the purpose of academic performance improvement. It helps students develop autonomy, self-organization skills, and critical thought too. Applications are often used as such mobile technologies, among which Telegram is becoming increasingly popular for educational purposes due to its accessibility, interactivity, and adaptability to mobile learning environments (Iqbal et al., 2020; Amran et al., 2024; Vahdat & Mazareian, 2020). Telegram is a mobile application that is actively used in the educational environment to support distance and hybrid learning. It is used as a platform for distributing educational materials, communicating between students and teachers, conducting mini-courses and independent work. This direction supports a goal that is expanding educational access. Telegram is a common platform among adolescents within Kazakhstan since it is simple, it lacks advertising, also users are able to create channels and bots. Telegram promotes digital literacy and prompt access to the educational materials. Telegram helps provide ample opportunities with content delivered to people. A Telegram bot helps disseminate material along with tests. This bot also collects feedback, tracks progress, with analyzes statistics.

Bots offer features for adaptive learning so a personalized method in education achieves its purposes using them as tools. The psychological aspect is one that is also worth noting: schoolchildren there in Kazakhstan often experience both stress and also anxiety as they each prepare for the UNT. The ability of a mobile application to prepare within a comfortable familiar environment reduces anxiety and also makes the process motivating and manageable. The application is able to remind and to motivate, also to plan individually; all of this contributes to preparation that is more organized with confidence.

1.3 Significance of the Study

This study's practical importance appears through creating and testing a Telegram bot for preparing 10th-11th grade students for the Unified National Testing (UNT) in English. Developed, the digital tool applies elements of gamification, adaptive learning, and an intuitive interface, preparing people accessibly and conveniently. Since class hours are limited, teachers are in short supply, educational resources are unevenly distributed, especially in rural regions of Kazakhstan, the Telegram bot effectively adds to the existing education system. It can be used by students for independent preparation, and it can be used by teachers as a tool for auxiliary purposes in the classroom. Educational institutions and also EdTech companies can use it as an element that is part of the digital infrastructure. Because it reflects the structure of UNT assignments, the bot does include training modules of vocabulary, grammar, and then reading, as well as diagnostic tests, a progress tracking system with access to official testing information. Its functionality does contribute to a deepening of subject knowledge and also to the forming of self-organization skills plus digital literacy and educational autonomy. The survey of students and teachers for the study provided data on perceiving and demanding individual functions, which allow us to improve the product because we take the real needs of users into account. Thus, as the Telegram bot

develops, it can contribute to expanding access in education, improving the quality of UNT preparation, and introducing modern digital solutions into Kazakhstani school practice.

1.4 Problem Statement

Thus, factors combine so: teachers are short, class hours are limited, the general level of English in the country is low, young people digitalize greatly, which indicates that someone needs to create a specialized mobile application for preparing for the UNT in English. A tool that is effective for the improving of preparation quality is the development of a Telegram bot integrated with modern teaching methods especially for students from regions with limited educational resources.

1.5 The aim of the Study

The purpose of this study is twofold: firstly, it aims to develop and Pilot Testing a Telegram bot designed to prepare for the Unified National Test (UNT) in English. Secondly, the study aims to assess the perception of students involved in UNT preparation regarding the functionality, usability and potential effectiveness of the bot as an additional teaching tool. Therefore, the following objectives are expected to be achieved:

1. To study the theoretical and methodological foundations of mobile learning of foreign languages, as well as the use of Telegram bots as mobile applications in the educational environment;
2. To develop a Telegram bot that includes modules on vocabulary, grammar, reading, trial tests and progress tracking, in accordance with the structure of UNT assignments in English;
3. To conduct pilot testing of the Telegram bot with a sample of students in grades 10–11;
4. To collect feedback from students on the experience of using the bot, assessing its usefulness, convenience and suggestions for improvement;

5. To evaluate the potential of the Telegram bot as a scalable digital tool capable of preparing for the English language exam.

1.6 Research Questions

1. How do students perceive the Telegram bot as a means of independent preparation for the UNT in English?
2. Does the Telegram bot have the potential for scaling and use in schools with limited educational resources?

1.7 The Structure of Thesis

The structure of this study consists of six chapters. Chapter One, that is, the introduction, consists of a brief introduction, historical background, such as The role of the UNT and difficulties in preparing in English and The potential of digital technologies and Telegram in education, Significance of the Study, Problem Statement, the aim of the Study, Research Questions. Chapter Two consists of a literature review that talks about the current problems of teaching English in Kazakhstan, the role of the UNT in Kazakhstan, the theoretical basis of this study, MALL and CALL, Telegram bots as a digital tool in learning a language and preparing for exams, the role of gamification in preparing for exams, the role of different types of teaching and materials, and an analysis of existing solutions for preparing for the UNT. Chapter Methodology, Chapter Three tells in detail how this study was done and how the Telegram bot was designed. Chapter Four, the Results Chapter tells the results of the survey: the first part shows the students' answers, the second teachers'. Chapter Five, the Discussion compares the results of my study and the research of other researchers. Finally, the last chapter of the conclusion gives brief summary including all information about this study.

CHAPTER 2

Literature Review

2.1 Current Problems of Teaching English in Kazakhstan

Teaching English in Kazakhstan has become a priority of educational policy along with this is especially true in the context of trilingual education. Yet, actually, structural issues happen. These problems obstruct effective language acquisition, especially within the regions. These difficulties cover organizational and methodological aspects along with socio-psychological ones; they form challenges that require an integrated approach. A central issue continues to be the few English hours in school. In some schools, students have only one or two lessons within a week, which does not allow them to develop sustainable skills (Gerfanova & Ismagulova, 2025). Bokayev et al. (2025) noted that “the existing English language teaching load does not correlate to the country's ambitions to integrate into the global educational space” (p. This situation is simultaneous. 6). The issue's second component is a severe lack of adept teachers in country areas. As Kassymova et al. (2025) point out, “in the regions, a meaningful proportion of teachers were not specially educated nor did communicate through use of modern methods” (p. 3). The Ministry of Education in the Republic of Kazakhstan confirms this. Data shows that up to 40% of rural English teachers have education of a related kind. A serious challenge still remains which includes the gap in English teaching between rural schools with urban schools. Urban schools tend to have better infrastructure with access to multimedia tools and highly trained teachers. However, outdated resources and understaffed faculties often plague rural schools (Gerfanova & Ismagulova, 2025). As Nabidullin as well as Zhanar (2024) note that “this imbalance starts unequal conditions and worsens educational inequality” (p. 4). Outdated textbooks that do not meet all modern requirements are used by many schools. Online platforms are not used effectively by teachers lacking digital literacy (Polatova et al., 2025).

Their access to these platforms does not negate this. Kassymova et al. (2025) highlight that “teachers often do not feel prepared enough to implement intercultural content and digital methods” (p. “Their teaching potential” is limited, they assert, by this lack of preparation. 6). Given that students possess low motivation and anxiety, the challenges in the teaching of English are compounded. Nagima et al. (2024) note, “most students view English as a difficult as well as stressful subject, especially in the context of low self-confidence” (p. 5). This stems from positive reinforcement absence and too much focus instead being on grammar over oral language development. “Developing positive attitudes toward English depends on the teacher’s confidence and ability to transmit motivation to the learner” (p. Montgomery and De Costa (2025) highlighted this in their study of teacher identity in CLIL settings in Kazakhstan. 8). Unequal access to resources and poor teaching make more students and parents use private tutoring or self-study. This increases social stratification. Not just everyone has access to those paid courses (Aliakbarova & Baitleuova, 2024). Students often find it hard to select reliable information reducing their independent work's effectiveness as Kassymova et al. (2025) note. Thus, English language teaching within Kazakhstan faces a number of persistent problems. These problems include limited access to materials, differences between regions in the quality of education, a shortage of qualified teachers, and low motivation as well as high anxiety among students. These challenges require more thorough solutions: teachers must have even better qualifications, methodological resources must be of a modern type, equal conditions must allow access to some education and new methods must focus upon personal development.

2.2 The Role of the Unified National Test (UNT) and the Specifics of English Language Preparation in Kazakhstan

In Kazakhstan, the Unified National Test (UNT) certifies final state performance, selects academics, and elevates society powerfully. As Jumabayeva (2016) notes, "UNT has

become a kind of social elevator." For students from rural areas, it is especially just the only chance for entering the country's leading universities" (p. 12). To be prepared for the UNT's English component is complex since it does involve pedagogical, psychological, and sociocultural factors. Schools' teaching methods see great change from the UNT. UNT also influences the learning of students. Berdygozhina (2024) states that higher UNT scores show a strong correlation with chances of getting a government grant for university studies. Because students apply to programs taught in the English language, this makes English language preparation of special importance. The exam acts as a very crucial filter for students' educational and career trajectories because of English's growing importance academically and also globally (Akhmetova & Soeharto, 2022). UNT's English section includes many components to assess grammar, vocabulary, and reading comprehension. Kazakhstan's Ministry of Education says the tasks are multiple-choice questions with gap-filling, identifying lexical meaning, plus paraphrase tasks. According to the CEFR scale, the difficulty level ranges from A2 to B2 (Sarmurzin, Amanzhol, & Toleubayeva, 2024). The test format has been criticized, however, as insufficiently assessing speaking and writing skills. Azhmukhambetov (2020) highlights that "this format creates a distorted preparation model" here. He says students focus on memorizing grammatical structures instead of developing "holistic language competence" (p. 19).

2.3 Digital Technologies in Language Learning: Theoretical Foundations

Modern digital technologies transformed the ways that people deeply teach languages and the ways that people learn languages. Contemporary pedagogical practices for teaching English as a foreign language are increasingly integrating gamification, autonomous learning, Computer-Assisted Language Learning (CALL), and Mobile-Assisted Language Learning (MALL). This paper explores for what these approaches have in support theoretically. This paper also regards the gains for people with these approaches and their

use. Language acquisition can be achieved through MALL that involves smartphones, tablets, and even mobile applications. The learning process is quite flexible as well as personalized and also interactive for the reason that it enables learners to practice languages at any real time regardless of their location or their schedules. As per Morchid (2020), “MALL supports ubiquitous learning as mobile devices ease authentic communication, which fosters learner autonomy and motivation” (p. 3). Ishaq, Zin, Rosdi, Jehanghir, and Ishaq (2021) do likewise highlight effectiveness of mobile tools. Mobile tools support vocabulary development as well as learner engagement together with long-term retention. MALL mainly benefits learners since they are able to access language learning apps such as Duolingo and Memrise, progress at their own pace, develop responsibility as well as engage through multimedia plus gamified content (Guo, 2022). Flexibility and individual agency are stressed through these advantages aligned with learner-centered pedagogies. Holec (1981) rooted autonomous learning in a learner's very own ability for them to control their own learning process. Learners set out their goals, select appropriate materials, and evaluate all outcomes to show their ability. In digital educational settings, autonomy is indeed increased since resources and also learning tools are accessible now. Learners' ability to make decisions concerning when, where, and how to study improves "autonomy in MALL contexts," often eased by app-based tracking and feedback mechanisms (Lenci, 2020). 28). Research suggests digital autonomy fosters self-regulated learning. This metacognitive skill is one that is necessary in both online and also mobile settings (Pérez-Paredes & Zhang, 2022). Guided instruction, mentor support, with formative assessment strategies sustaining engagement and progression must scaffold autonomy for it to be effective. In language instruction, CALL is a broader, historically grounded approach including digital tools and computer use ranging from virtual classrooms to grammar software. According to Warschauer and Healey (1998), it is said that CALL has evolved through behavioristic and communicative and integrative phases. These phases

mirror shifts in pedagogical theory from repetition drills toward communicative competence as well as multimedia integration. CALL systems today feature platforms such as Moodle and Canvas with digital dictionaries, grammar trainers, and feedback systems that are automated. Virtual conferencing tools are, for example, such options as Zoom and Microsoft Teams.

Zain and Bowles (2021) stressed CALL improves formal education through collaborative learning settings, multimodal interactions, and personalized content delivery. People do apply game-like elements in the non-game contexts. For instance, education gets gamified.

Gamification manifests itself in MALL and in CALL through progress that is tracked and leaderboards. Badges and levels and even points are features as well of gamification. In their systematic review of Duolingo-based studies, Shortt, Tilak, Kuznetcova, and Martens (2021) argue that gamification motivates, engages, and also makes learners persist greatly. Learner anxiety can be then reduced, and confidence can be thus increased, and attitudes that are positive fostered toward the target language through language learning that is gamified. Apps make repetitive practice both enjoyable and meaningful through social competition, rewards, and challenges, aligning with motivational theories like Self-Determination Theory (Ryan & Deci, 2000; Jeon, 2022). Digital technologies reshaped the landscape for language education since MALL, CALL, autonomous learning platforms, and gamified systems exist.

Innovations promote these 21st-century competencies instruction that is interactive, flexible, and learner-centered aligns with. Teachers using strong pedagogical theory, coupled with professional development, find digital approaches greatly improve lifelong learning skills, language expertise, and motivation. However, their success depends upon integrating mindfully, evaluating tools critically, and educators cultivating digital pedagogical literacy.

For those students who are without any prior experience in standardized testing, the UNT represents a situation of high-stakes and high-stress. Shabdenova and Satybayeva (2024) stated that the transition to a digital format in 2021 “has exacerbated anxiety among students

unaccustomed to online testing." This was particularly true in rural schools (p. 7).

Karabassova (2021) supports this view by stating that it is more than 40% of students who feel heightened anxiety before the UNT, especially when they study language subjects. As a result, rote learning practices that are focused exclusively on the test format often replace school teaching strategies. Because of this, the quality of language education is weakened. Teachers and students both are forced into alignment with exam requirements, even when communicative and student-centered approaches conflict (Jumabayeva, 2016). That disconnection of the UNT tests from school lessons is surely a key issue. Curricula as well as textbooks often fail to sufficiently prepare students for the test's formal structure. Mingisheva (2023) notes that rural schools lack for methodological resources. This also does mean that they do lack specialized preparation courses for the UNT, which is a cause of systemic inequality (p. 10). Alignment for the exam's context is what the English language teaching process frequently lacks. Karabassova (2020) points out that "teachers are not always aware of the latest changes in the UNT format, so the preparation is fragmented and ineffective" (p. 13). Educational inequality is deepened as a result because students' success depends more on paid preparatory courses than it does on formal school instruction. Kazakhstan's education system benefits greatly from the UNT's English section. However, the current structure needs pedagogical support that is more targeted for it. Existing challenges are worsened via high levels of student anxiety, the absence of productive skill assessments, and the misalignment between school practice and test demands. To address these issues, it is important that you modernize the test format including speaking and writing components; provide schools equal accessibility to high-quality preparatory materials; train teachers specifically to instruct test-oriented material; systemically support students facing high-stakes assessments psychologically. These improvements would improve the fairness also the educational value

of the UNT because they ensure that it supports rather than obstructs linguistic and academic development.

2.4 Telegram Bots as a Mobile Application Format in Education

The digitalization of education with mobile device spread made new formats surface for organizing learning. Telegram bots along with smart agents have become one promising solution for users. They have been built into the popular messenger. Because Telegram has open architecture as well as is accessible, it is turning into truly not just a communication tool, but a complete mobile educational application which can partially or else completely replace learning management platforms (LMS). Telegram is a digital ecosystem featuring integrated bot support also open API. It is a messenger with cross-platform capabilities also. You can apply it to Android, iOS, Windows, Linux, also macOS. The application is compatible across every operating system. Telegram has high speed with stability, encrypts data, and embeds multimedia and interactive content. Ong, Lee, and Tan (2021) note of the fact that Telegram communicates in an effective way between teachers and students, especially at times when learning is distant and is also hybrid. Unlike heavyweight LMS platforms, Telegram works even under a weak internet signal, important especially in countries with limited digital infrastructure. “Learning while mobile” is what mobile learning (M-Learning) involves. This model suits Telegram perfectly. Alcayde and Montoya (2017) stress Telegram allows instant feedback and constant availability of learning materials. The app can store prior interaction histories too. Micro-learning, which it has a high level for engagement, is learning of it in small portions making this an effective tool. Maksudbek o‘g‘li (2025) notes Telegram needs little technical work: accessing the bot is possible for students through a link absent an application download. Learning becomes more accessible thus lowering the entry barrier for those learning something. Telegram bots are like software agents. They are able to interactively exchange messages with all of the users. They can

perform many functions, including assignment sending, testing, content adapting, with analytics collecting. Han, Lee, and Kim (2021) implemented a Telegram Quiz Bot to support an environmental chemistry course. Instant feedback was given when the bot generated topic-based tests. Student progress also was saved. Elements that were adaptive allowed for microlearning. Filatova, Petrov, and Smirnova (2023) used a Telegram bot for automatically sending out educational assignments. This was done within a distance learning course to collect responses. Routine processes were automated as the teacher's workload got reduced by this approach. Johnson, Liu, and Carter (2022) proposed a self-learning assistant bot that is able to conduct branched dialogues while responding to the learner's interests as well as guide them along an individual trajectory. Amalia (2024) created a flexible grammar bot, and this bot shifted to the language learner's skill since analysis of prior answers occurred. Learning became flexible so user-centered this way. Telegram provides both Bot API and Telegram API as the two API levels. The former one is used much more often. Because complex programming is not needed, educational solutions can be created. For Python's simplicity and powerful libraries—aiogram, pyTelegramBotAPI, python-telegram-bot—it develops Telegram bots as one of the most popular languages. Abd Samad et al. (2022) demonstrated the use of Python and of Telegram in order to organize object-oriented programming teaching. The developed bot allowed students assignment completion plus individual progress tracking via automatic feedback. Rahmatulloh et al. (2024) proposed for Telegram a bot with a web scraping function. It was the bot's function to go and collect scientific articles upon a user request. In this academic example, a clever, cross-platform assistant is clear. For a specific user, adapting of a Telegram bot used machine learning (Gorrino, 2020). The bot offered the relevant resources that were based upon the analysis of previous messages. This improved upon the aspect of personalization for learning. Telegram bots have been used with success within language learning. They benefit scientific, technical,

and humanities fields too. Telegram bots' ease of implementation as well as scalability have made them a convenient alternative for mobile applications in science education, note Bogliolo et al. (2025). Ong et al. (2021) describe the integration of a Telegram bot into the LMS. The university under question is a Malaysian one. The bot gave access for users to assignments. It was also a notification tool, letting students have direct interaction with the teacher. It is also worth noting that Telegram bots are becoming within blended learning because they provide support to students between face-to-face classes and create continuous educational settings (Filatova et al., 2023).

Telegram bots offer undeniable advantages such as speed and implementation flexibility. Buttons provide interactivity, and unified access provides versatility for them. Yet several items still restrict it: a reliable Internet link is important; Telegram API restricts requests each minute; large groups require moderation and control; privacy could be problematic ("it incompletely complies with GDPR in the EU"). However, the right bot architecture with a flexible pedagogical strategy can eliminate most limitations. Telegram bots have established themselves as an effective mobile learning tool. Their advantages do include adaptation and automation capabilities as well as general accessibility and cross-platform options. Both IT specialists and teachers without any technical background can access them due to Python support as well as an open API. They will be integrating Telegram bots into the LMS, using AI in order to personalize them and to expand their functionality with the use of big data technologies in the future within education. Since their application includes language learning in addition to STEM, humanities, and also social sciences, it transforms education in a digital way and is a universal type of tool.

2.5 Gamification and Engagement in the Context of Exam Preparation

Anxiety, stress, also decreased motivation to learn customarily accompany the process of preparing for exams. Interest in gamification is growing as preparing for high-

stress exams, like the UNT, IELTS, SAT, etc., makes this problem especially acute. In this regard, gamification involves introducing game elements into the educational process. Gamified tools, most notably those implemented within the Telegram platform via chatbots, allow for you to transform perception of exam preparation as they make such preparation more motivating, personalized, also sustainable for perception. Gamification in learning is including game components like points and levels and badges and progress bars within educational scenarios. Because of the achievement effect, feedback, also visualization of progress (Avenberg & Sjöblom, 2021), these elements improve students' intrinsic motivation also increase their interest. The game structure creates interest for those completing tasks as well as passing levels instead of any sense of coercion within learners unlike the customary approach that increases engagement plus reduces the perceived load (Belda-Medina & Calvo-Ferrer, 2022). Progress is visualized, thereby turning learning into a sequential path with concrete stages and results, rather than a formless cramming. Anxiety mainly obstructs effective preparation in general. The research shows the gamified format reduces stress because learning occurs in a safe, non-evaluative, interactive environment. Learners can repeat tasks as needed without fear of mistakes (Yoldoshev & Akhmedov, 2024). Here, Telegram bots have a special role to fulfill. This is on account of both their asynchrony and their anonymity. Galiya as well as Aisha (2024) state the Telegram bot allows students to work with a comfortable pace. According to them, students do not experience social pressure from classmates or the teacher. This is especially important for students who are anxious or introverted showing low performance within a typical setting. Thus, gamification can motivate people, and also it can offer psycho-emotional support for all of those who are preparing for exams. Telegram bots can be a platform that is optimal for introducing gamification into the educational process. They become great due to their technical openness, versatility, and accessibility. Telegram functions on desktop and mobile devices without

requiring individual installs. Python enables development of its APIs quickly and inexpensively so Araneta et al. used it in 2020. Solutions that are based upon Telegram are becoming more especially relevant within microlearning contexts for presenting material within small portions along with quick feedback. Educators can integrate quizzes, reminders, messages, media, and mini-games using Telegram bots to create flexible educational settings, Ong, Lee, and Tan (2021) highlight. Araneta et al. (2020) described the Substituto bot as an example so it implements “quick tasks” with a timer, level progression, as well as a leaderboard. User engagement was indeed high and the material review time also increased. The full range for gamified mechanics can be implemented by way of Telegram bots: Adaptive quizzes may be adjusted to the level of the learner, as Han, Lee, and Kim (2021) describe in their bots. Automatic checking, instant feedback, and accumulation of results raise self-learning effectiveness. Points and ratings build friendly competition. Engagement does increase as users strive for getting more of the points and to get into the top leaders. The bot is able to issue virtual badges. This may assist in reaching aims such as 10 right answers consecutively. The feeling of progress in addition to recognition of achievements is certainly improved (Galiya & Aisha, 2024). Progress bars are there to visualize the adventure for the user. They display progress from novice to ready. Attention retention and motivation are in fact greatly increased by the visual display of progress, as was stressed by Belda-Medina and Calvo-Ferrer (2022). All these elements can be implemented through the Python libraries `python-telegram-bot` or `aiogram`, thereby making the platform accessible to both technical specialists and educators without an IT background. Gamification within the educational environment, especially when educators do prepare exams, does not just trend now, but effectively teaches while focusing on motivating, on engaging, and on reducing anxiety. Material that is repeating turns a process that is passive into an adventure controllable and exciting. Such approaches can be implemented by use of technology. For instance, Telegram

bots offer a convenient basis. Since they are simple, accessible and cross-platform, they attract learners within mass distance and mobile learning. For exam preparation, adaptive Telegram bots that consider the style, level, and emotional state of students connect with gamification's future. Personalized as well as supportive learning will see new horizons open through analytics and artificial intelligence element integration.

2.6 The Role of Video Explanations and Multimodal Materials in Language Teaching

Modern language teaching increasingly relies on resources that happen to be multimodal like video explanations, subtitles, visualizations, with audio accompaniment. These tools greatly affect learners' autonomy development, cognitive load level, and the effectiveness of learning new material, especially self-paced online learning and digital platforms. Video explanations activate different perception also memory channels because they combine visual, auditory, and textual components. Multimodality improves vocabulary memorization, grammatical constructions, as well as contextual understanding, research shows (Baranowska, 2022). Auditory memory gets activated by the audio channel, also mental associations are created by visual images, especially if learning a foreign language. Importance does particularly belong to the use of subtitles. Baranowska (2022) claims subtitles allow people to better grasp and recall terms shown concurrently with the audio track and visual setting. Thus, multimodal videos create conditions for deep processing of information so that deep processing, according to the levels of processing theory, increases the likelihood of long-term memory. Efficiency in learning depends on the balanced use of working memory resources according to cognitive load theory (Sweller, 1988). If properly designed, multimodal materials allow the load to be distributed among the visual and verbal components. Because a degree of excessive cognitive strain is getting reduced, such a distribution is indeed possible. According to Ginting (2022), video explanations designed well while adhering to cognitive learning theory raise productivity in learning. They do

include elements like that of highlighting key ideas. Animations, visual arrows, and also interactive inserts are included. The learner can focus upon the essence of the material. This also works to prevent short-term memory from overload. High cognitive load videos such as filler text along with fast speech without visual cues lead to poorer learning outcomes as the Bahari, Wu, and Ayres (2023) study shows. In contrast, comprehension and also motivation improve with paced structured videos. For independent learning, video explanations especially in online and blended learning are becoming a necessary tool. Learners can self-regulate due to well-designed video resources, according to Ginting (2022). Learners can pause, review, and repeat through the material, and this adapts the resources to their own learning pace. Video lessons stimulate the development of learning autonomy like when they include interactive elements and built-in tasks, as Laubscher's (2021) systematic review showed. Learners can build individual trajectories for themselves. Thus they do become more actively involved in such a process. Olivier (2021) stresses videos created using multimodality with microlearning perform well. These videos repeat and then systematize material in a particularly good way. Because of the format they provide, short learning modules can be used in daily practice.

2.7 The Analysis of existing solutions for preparing for English language exams in Kazakhstan and abroad

For preparing students for language exams, educational platforms and digital solutions are increasingly integrated due to English's growing importance as a professional and academic resource. This is especially relevant within countries with a developing educational infrastructure, such as Kazakhstan. Tools effective also accessible toward preparing for the UNT and international exams such as IELTS and TOEFL are in demand there. Common solutions are Duolingo, Quizlet, EnemPrep (in Brazil), and various Telegram bots common abroad plus in Kazakhstan. Duolingo, built upon the principles of gamification

and adaptive learning, is a famous language-learning platform. It offers to users a point system in addition to levels. Reminders and micro-exercises stimulate regular practice through repetition. The platform has machine learning elements so it adapts to the student's level for learning that is customized (Loewen, Isbell, & Sporn, 2020). Despite its strengths - it is widely available, its database is free, and it engages users highly - Duolingo does not design itself specifically for exam preparation, does not cover skills such as writing and speaking, and teachers can monitor progress with it only to a limited extent. Quizlet focuses more on memorizing of terms and also vocabulary by the use of flashcards. Duolingo does not have that focus now. Vocabulary review plus grammar reinforcement and exam preparation are actively used for it. Quizlet lets you work in groups plus create flashcard sets easily. Quizlet is a convenient tool for self-study due to this software's support for multiple languages. The platform, however, is focused more so on passive recognition and does not cover productive aspects of language, for it is having no built-in adaptability, limiting its use in the context of exam preparation that is full-fledged. EnemPrep represents a great nationwide answer that readies pupils for the Brazilian exam Enem, an UNT counterpart. Topic-based tests, adaptive simulators, and detailed analytics are included in the platform. For specific exam formats, students are allowed to identify weaknesses and prepare (Silva & de Azevedo, 2022). Its localized approach and its strict focus upon exam objectives are EnemPrep's strengths. However its use is only in the national context and the architecture cannot scale past Brazil lacking multilingual support. Telegram bots do increasingly play a role that is important within education recently, especially in cases where resources that are technical are limited. Telegram serves in Uzbekistan, India, Iran, and some of Europe for newsletters, tests, mini-courses, and educational assignments delivery (Yoldoshev & Akhmedov, 2024; Han, Lee, & Kim, 2021). Telegram bots turn out convenient since they do not require users to install applications that are additional as well as working easily on weak

Internet, also supporting multimedia functions. In Kazakhstan, Telegram bots are still used sporadically. Private tutors or teachers do most often use them now. Per Ivanova and Zabolotnykh (2023)'s study, one rural Telegram bot acted as a UNT preparation training platform lacking analytics, personalization, and gamification. The Telegram bot for preparing for the UNT in English seeks to do what is to eliminate their limitations and combine the strengths of all platforms mentioned above. Someone built it on tasks when the tasks match the actual exam format; therefore, its main innovation covers grammar, vocabulary, and reading making preparation targeted and similar to the real assessment. The bot adapts the tasks to meet the level of the student (A2-B2), on the basis of his current results, not just like universal language applications. That can ensure an individual's learning pace and a more gradual complication. Gamification elements, such as points, levels, badges, and also rankings, do encourage people for participating regularly in classes as well as challenge and motivate them (Araneta, Eryiğit, König, & Lee, 2020). Technically, the bot is capable of automatically collecting statistics as it can generate progress reports plus it can synchronize with Google Sheets or LMS, which is especially convenient for teachers. The interface is accessible even to those with only limited digital literacy, and also its operation needs absolutely no high internet speed. The bot particularly attends to multimodality through the inclusion of video explanations prepared in accordance with the principles of cognitive load in addition to subtitles and logical segmentation, which makes learning much more understandable plus effective (Bahari, Wu, & Ayres, 2023). Telegram bots, therefore, as opposed to existing platforms, represent a scalable, accessible as well as flexible solution regarding English language exam preparation. When they integrate into Kazakhstan's educational system within regions where resources are limited, they take an important step toward digitalization as well as improving how they train students. Unlike universal applications, Telegram bots for educational support are a relevant and promising tool because

they adapt to specific learning conditions, take into account UNT specifics, and can be localized to national standards. After the researchers did analyze the existing literature that was on digital educational technologies plus English language exam preparation, they then revealed a number of meaningful gaps that exist, especially in the context of solutions for Kazakhstan. Duolingo Quizlet and EnemPrep are platforms that present different ways of reviewing and teaching language material. But most of them are universal or oriented to other systems of education so they do not consider the UNT specifics as a national exam. Key limitations include: (1) most international platforms lack focus on exam-oriented skills; (2) adaptation to the cultural and linguistic context of Kazakhstani students is insufficient; (3) gamified Telegram bots see limited use in a systematic, scalable form; also (4) research does not examine the effectiveness of such bots specifically in the context of UNT preparation. In addition to that, the current literature mainly approaches language learning in a broad manner. It also applies gamification while it is without a focus on exam motivation (Belda-Medina & Calvo-Ferrer, 2022; Yoldoshev & Akhmedov, 2024). Given this fact, developing a Telegram bot adapted for preparation for the UNT has obvious scientific and practical value. Such a solution can combine a number of important components like exam specificity in vocabulary, grammar, and reading in a test format, multimodality that includes video explanations along with audio plus infographics, gamification elements such as points, levels, and progress, as well as performance analytics. Telegram as platform is accessible under conditions of poor internet connection. This makes Telegram valuable especially for rural schools and remote regions across the country (Ivanova & Zabolotnykh, 2023). The above shows to us that we are in need to study a thing. It is vital to evaluate how well the Telegram bot functions. The work will test its impact upon students' motivation as well as anxiety levels plus academic performance also fill the gap within the academic literature about localized digital solutions in national examination systems. Data on material acquisition

quality, use frequency, and engagement will be collected in the empirical section. Of this tool, the perception held by students will also be gathered. These results provide a base for EdTech innovations in Kazakhstan as well as other countries.

CHAPTER 3

Methodology

The development of digital educational technologies in Kazakhstan, especially in the context of a shortage of qualified teachers and limited access to preparatory resources in the regions, requires the search for effective tools for independent preparation for exams. In particular, the focus of this study is the design and testing of a Telegram bot designed to help 10th-11th grade students prepare for the Unified National Test (UNT) in English. This chapter describes the methodology of the study aimed at analyzing the perception, usability, and functionality of this digital product from the point of view of end users – schoolchildren.

3.1 Purpose and Objectives of the Study

The purpose of this study is twofold: firstly, it aims to develop and Pilot Testing a Telegram bot designed to prepare for the Unified National Test (UNT) in English. Secondly, the study aims to assess the perception of students and involved in UNT preparation regarding the functionality, usability and potential effectiveness of the bot as an additional teaching tool. Therefore, the following objectives are expected to be achieved:

To study the theoretical and methodological foundations of mobile learning of foreign languages, as well as the use of Telegram bots as mobile applications in the educational environment;

1. To develop a Telegram bot that includes modules on vocabulary, grammar, reading, trial tests and progress tracking, in accordance with the structure of UNT assignments in English;
2. To conduct pilot testing of the Telegram bot with a sample of students in grades 10–11;
3. To collect feedback from students and teachers on the experience of using the bot, assessing its usefulness, convenience and suggestions for improvement;

4. To evaluate the potential of the Telegram bot as a scalable digital tool capable of preparing for the English language exam.

3.2 Methodological Approach

To solve research problems and achieve the goal, theoretical methods joined empirical methods: literature analysis, questionnaires, design method and data analysis. A theoretical review was conducted regarding scientific publications about teaching English and about preparing for exam formats through Telegram bots as well as mobile applications. In digital learning and mobile technologies in education, researchers reviewed both foreign and domestic studies. The study plans to conduct an online survey through using the Google Forms service to obtain empirical data. Students in 10th-11th grade comprise the survey's intended respondents as they get ready for UNT. The plan is to collect responses from approximately 20 students because they represent a private and public school network. The questionnaire for students is aimed toward identifying their experience. Also, the study seeks to identify attitudes concerning English independent study using digital instruments. People answered questions about experience before UNT in English plus average weekly preparation hours plus perceptions of Telegram's usability for education plus assessment of the Telegram bot functionality from one to five plus preferences for individual bot sections like grammar, vocabulary, reading, trial tests, and progress tracking. For improving the application, respondents can express suggestions in an open-ended sort of question. This question ends the questionnaire. Quantitative as well as qualitative methods will be used in order to analyze the data collected. Trends as well as distributions are identified via closed questions aggregated into diagrams plus tables. For respondents, thematic analysis will be used on open-ended responses to highlight the most frequently mentioned ideas, comments, and suggestions. This approach is going to allow for assessing the perception of that Telegram bot. Another benefit involves taking into account the feedback for improvement. To support students in preparing

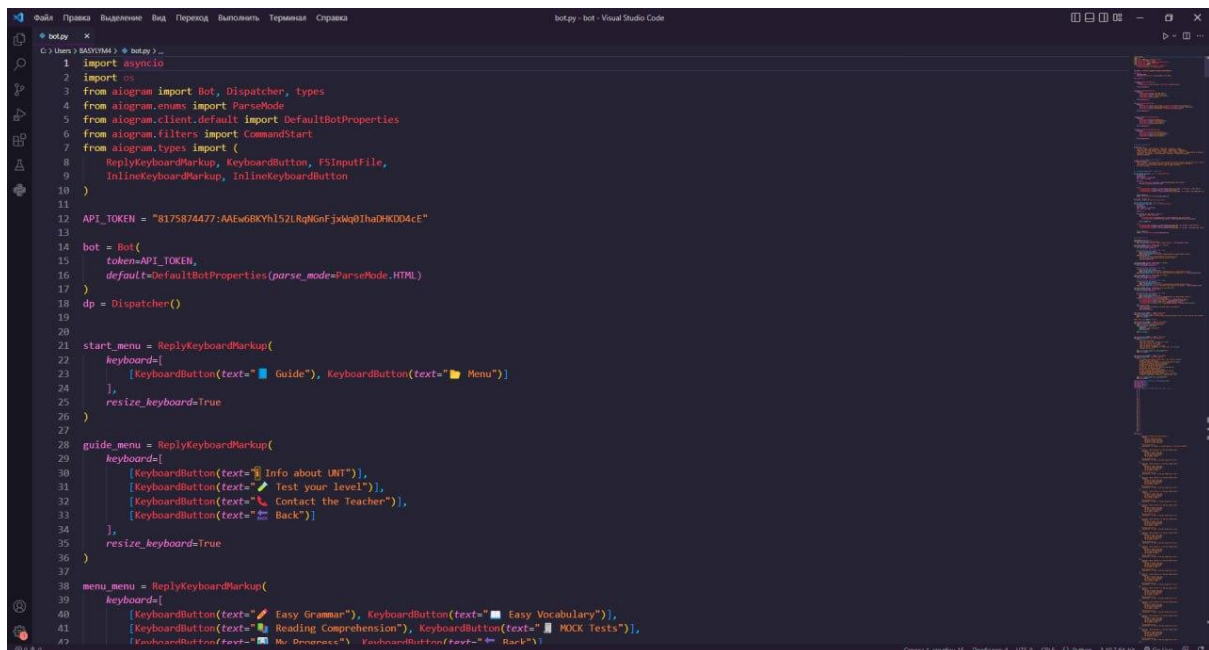
for the UNT inEnglish, a Telegram bot prototype was designed then implemented as part of the study. For the user, oriented design, modularity, and also intuitive navigation are the principles that the bot's architecture is based upon. "Guide" and "Menu" are offered to the user as two main categories on the homescreen. Information and orientation are provided in the "Guide" section. It includes also four buttons. The first one, "Information about the UNT", gives access to official documents and data. The document contains test specifications, a testing plan, and a list of teaching aids that the Science and Education Ministry advises. The second one, "Find out your level", contains a diagnostic test based upon tasks originating from the official website for the National Testing Center, as this allows for the student in order to determine their current level concerning readiness. The third one is "Contact the teacher," including the consultant's contact information like a Telegram account with email address. It gives users feedback options and tailored assistance. "Back", the fourth button, allows the user to return back to the main menu. A number of training modules by the training block are offered in the Menu section. The Easy Grammar module has video materials for explanation of key grammar topics and it has comprehension tests inside. Vocabulary selections by levels along with topics (Elementary, Pre-intermediate, Intermediate) are in the Easy Vocabulary module, improved by consolidation tasks. Texts of varying difficulty levels are used in the Reading section then people are asked to understand them. The MOCK Tests section

3.3 Telegram Bot as a research Object

The bot was created in the Python programming language using a special library `python-telegram-bot`, which helps to easily create buttons, menus and commands. The Figure 1 below shows a piece of code where the main buttons of the bot are configured.

Figure 1

Fragment of the Telegram bot code developed in Python using the python-telegram-bot library.



```

1 import asyncio
2 import os
3 from aiogram import Bot, Dispatcher, types
4 from aiogram.enums import ParseMode
5 from aiogram.client.default import DefaultBotProperties
6 from aiogram.filters import CommandStart
7 from aiogram.types import (
8     ReplyKeyboardMarkup, KeyboardButton, FSInputFile,
9     InlineKeyboardMarkup, InlineKeyboardButton
10 )
11
12 API_TOKEN = "8175874477:AAEw6BKYh152LqN6F-jkq@1haDHK004cE"
13
14 bot = Bot(
15     token=API_TOKEN,
16     default=DefaultBotProperties(parse_mode=ParseMode.HTML)
17 )
18 dp = Dispatcher()
19
20
21 start_menu = ReplyKeyboardMarkup(
22     keyboard=[
23         [KeyboardButton(text="📖 Guide"), KeyboardButton(text="📁 Menu")]
24     ],
25     resize_keyboard=True
26 )
27
28 guide_menu = ReplyKeyboardMarkup(
29     keyboard=[
30         [KeyboardButton(text="📖 Info about UNT")],
31         [KeyboardButton(text="📝 Test your level")],
32         [KeyboardButton(text="👤 Contact the Teacher")],
33         [KeyboardButton(text="🏠 Back")]
34     ],
35     resize_keyboard=True
36 )
37
38 menu_menu = ReplyKeyboardMarkup(
39     keyboard=[
40         [KeyboardButton(text="📖 Easy Grammar"), KeyboardButton(text="📖 Easy Vocabulary")],
41         [KeyboardButton(text="📖 Reading Comprehension"), KeyboardButton(text="📖 MOCK Tests")],
42         [KeyboardButton(text="📖 Mu. Dinamica"), KeyboardButton(text="🏠 Back")]
43     ]

```

Note. Screenshot taken by the author during the development of the Telegram bot in Visual Studio Code.

As shown in the Figure 2 when users click the link to launch the bot, they are greeted by an introductory interface. This screen briefly explains the bot's purpose: to help students prepare for the English section of the UNT using quizzes, vocabulary tasks, grammar practice, and reading exercises. The colorful visual design and concise bilingual message aim to engage students right from the start and reduce initial anxiety about test preparation.

Figure 2

Welcome screen of the BikiUNT Telegram bot.



Note. Screenshot taken by the author during the user testing of the Telegram bot.

After clicking “Start,” users are greeted with a welcoming message and presented with two key navigation buttons: “Guide” and “Menu.” The “Guide” section was intentionally placed at the beginning to help students understand how the bot works and familiarize themselves with the structure and requirements of the English section of the UNT. This user-friendly design helps reduce initial confusion and ensures smoother onboarding, especially for those who are unfamiliar with exam preparation apps.

Figure 3

Main interface of the BikiUNT bot with the “Guide” and “Menu” options.

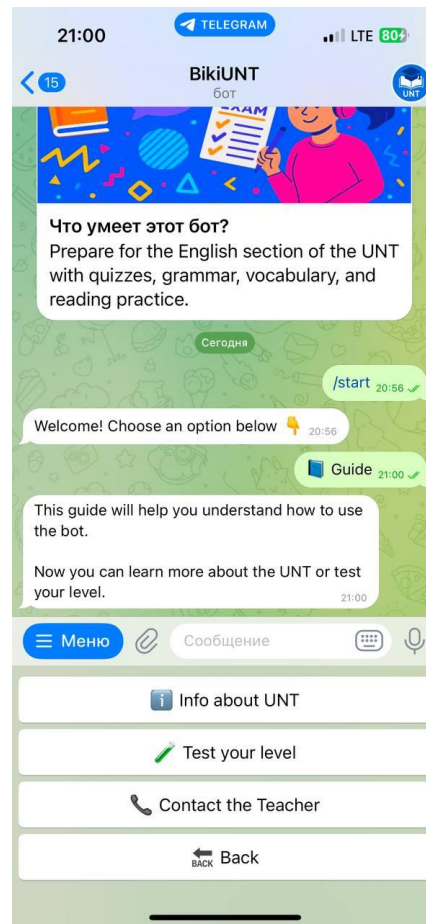


Note. Screenshot captured during the initial launch phase of the Telegram bot by the author.

After selecting the “Guide” button, users are taken to a submenu that introduces them to key informational components of the exam. As shown in the Figure 4, the available options include: Info about UNT – provides official information about the English section of the UNT, including structure, question types, and grading criteria. Test your level – offers a diagnostic test to assess the student’s current English exam at UNT readiness. Contact the Teacher – allows the user to reach out for academic support. Back – returns the user to the main menu. This structure was designed to ensure that students receive foundational information before beginning practice tasks, helping reduce uncertainty and improve learning orientation.

Figure 4

Navigation within the “Guide” section of the BikiUNT Telegram bot.



Note. Screenshot captured by the author during pilot testing of the Telegram bot interface.

After clicking on the “Info about UNT” button in the Guide section, the user is shown four informative options designed to provide clarity on the exam format and preparation resources: Test Specification – outlines the exam structure and scoring system. Test Content – provides examples and explanations of typical question types in the English section. Test Plan – explains the scheduling, duration, and section breakdown of the UNT English test. List of Recommended Textbooks – links to materials endorsed by the Ministry of Education for exam preparation. This submenu gives structured, official information in one place, allowing students to understand what to expect from the English section of the UNT and plan their preparation accordingly.

Figure 5

Submenu “Info about UNT” in the BikiUNT Telegram bot.

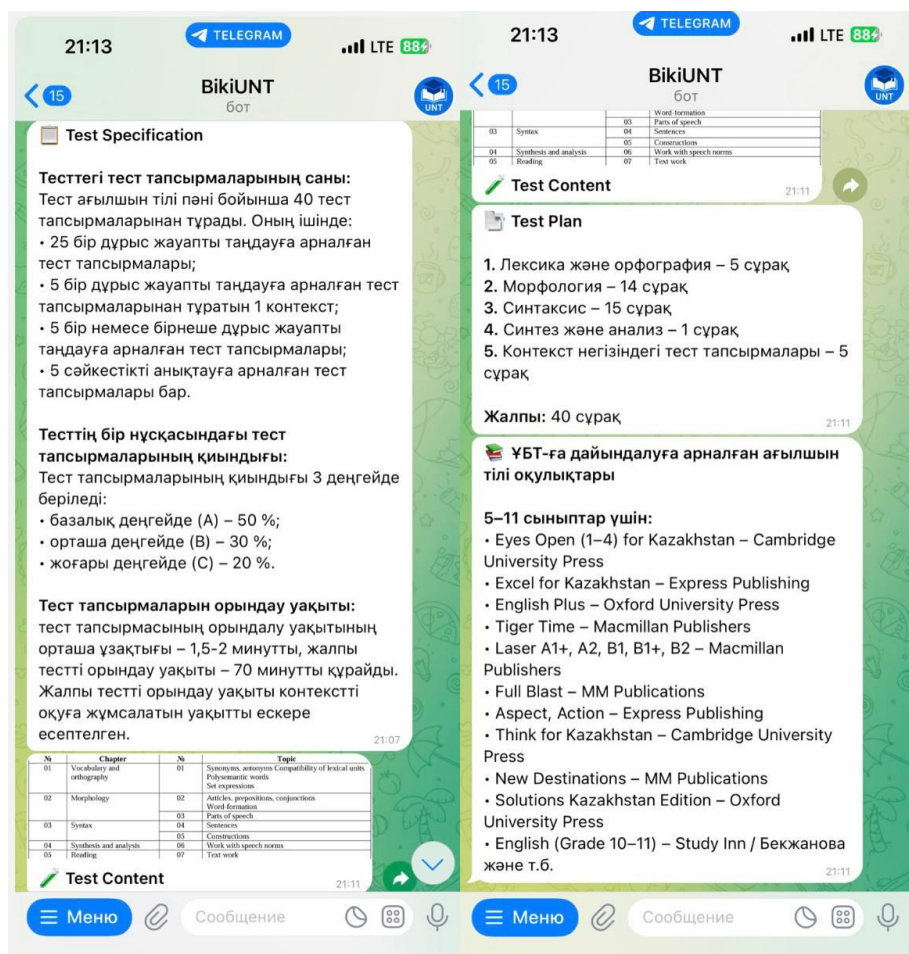


Note. Screenshot captured by the author during interface testing of the educational Telegram bot.

This figure displays what students see after selecting the respective buttons under the “Info about UNT” section. The following content is shown: Test Specification provides the structure of the English UNT: 40 test questions in total, divided into several types (e.g., choosing one correct answer, matching, identifying context-based meaning). It also explains the difficulty levels (A, B, C) and time allocation (70 minutes in total). Test Content outlines the main linguistic categories, including syntax, morphology, sentence analysis, and vocabulary. Test Plan lists the number of questions per topic (e.g., 14 for morphology, 5 for orthography). List of Recommended Textbooks contains officially approved textbooks by the Ministry of Education (e.g., “Eyes Open,” “Excel for Kazakhstan,” “Laser A1+”) used across grades 5–11. These sections help students understand the structure, difficulty, and resources relevant to English UNT preparation.

Figure 6

Detailed sections available under “Info about UNT” in the BikiUNT Telegram bot.

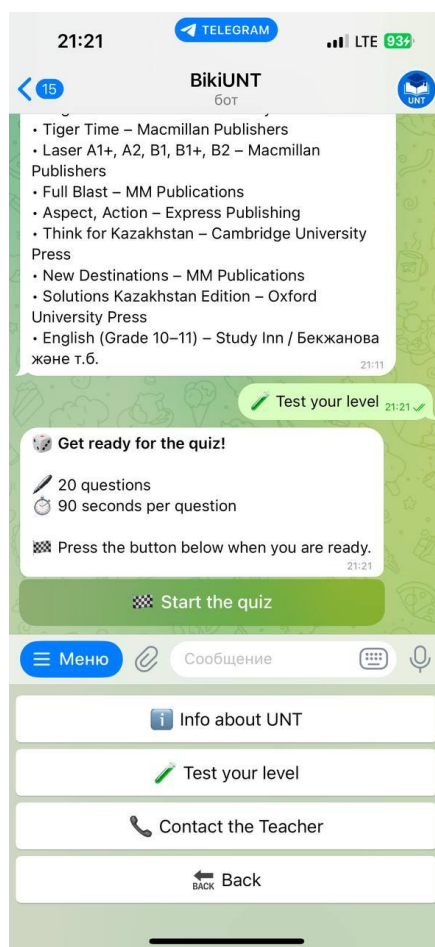


Note. Screenshot captured by the author from the Telegram interface during testing of the educational bot.

The Figure 7 illustrates the next stage in the bot's flow, where students can take a diagnostic quiz to determine their level of readiness for the English section of the UNT. After clicking on the “Test your level” button, users are presented with an introductory message. It informs them that the quiz consists of 20 questions, each with a time limit of 90 seconds. Importantly, the quiz does not begin immediately after selecting the option. Instead, students must additionally click the inline button “Start the quiz.” This extra step was intentionally designed to prevent the quiz from starting accidentally and to allow the user to find a quiet or comfortable place before beginning. The test is based on official materials from the National Testing Center, making it a valid and reliable tool for diagnostic purposes.

Figure 7

Diagnostic testing interface via the "Test your level" feature in the BikiUNT Telegram bot.



Note. Screenshot captured by the author during bot testing on a mobile Telegram interface.

After the student clicks the “Start the quiz” button, the bot does not immediately launch the quiz. Instead, as illustrated in the Figure 7 it displays a short countdown-style animation: “3 Hey! 2 Ready? 1 Set! GO!” This is not just a decorative element. It serves an important psychological function — it helps the student prepare emotionally, focus, and reduce stress before the test. Such an element makes the interface friendly and less formal, especially for schoolchildren who may feel anxious before the test. In addition, it increases interactivity and user engagement.

Figure 8

Animated countdown before starting the diagnostic test in the BikiUNT Telegram bot.

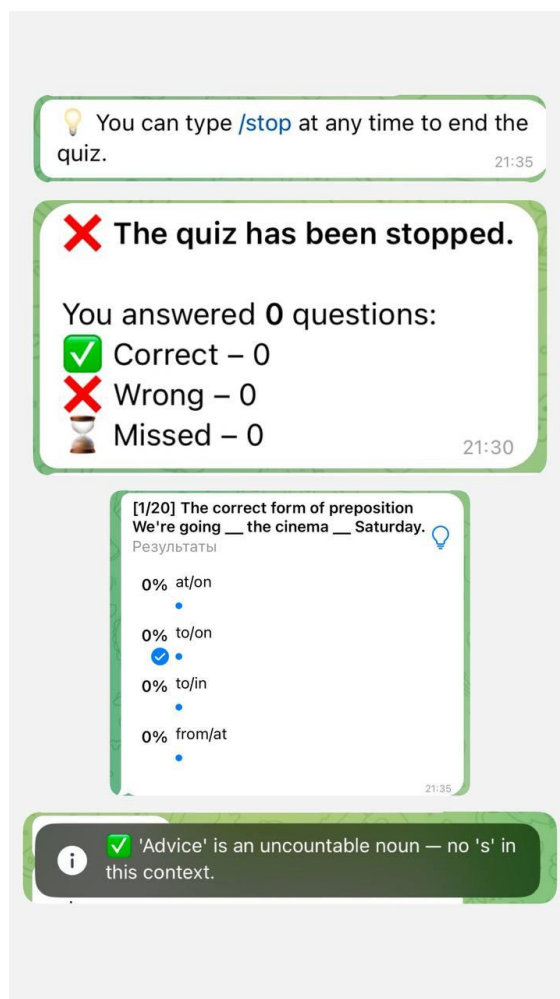


Note. Screenshot and animation captured by the author during test simulation in the Telegram mobile interface.

The Figure 9 shows one of the key additional features of the diagnostic test — the ability to interrupt. The user can enter the /stop command at any time to end the test. This feature was added after the first testing, when it turned out that even when switching to another menu, the test continued to run, interfering with interaction with other sections. After stopping, the bot shows how many questions were: Answered correctly, Incorrectly, Skipped. During the test, the bot also gives instant feedback. If the answer is correct, a fireworks animation appears. If the answer is incorrect, a short explanation automatically appears at the top. In addition, each question has a button in the form of a light bulb in the upper right corner. When pressed, the student receives an additional explanation, even if he chose the correct answer. This helps not only to understand the error, but also to remember the rule.

Figure 9

Diagnostic quiz control features and feedback options in the BikiUNT Telegram bot



Note. Screenshot captured by the author during real-time testing of quiz functionality in the BikiUNT bot.

As shown in the Figure 10, this section provides the student with a direct channel to contact the English teacher. After clicking the Contact the Teacher button, the bot displays a message with two ways to get in touch: Telegram nickname: @bikibomishere, Email: darkhanqzy.a@gmail.com. The purpose of this feature is to provide additional support to students who have questions during independent preparation. This is especially important for students in remote areas, where access to tutors and live explanations may be limited. Contact with the teacher helps build confidence and reduces stress before the exam.

Figure 10

Teacher contact information interface in the BikiUNT Telegram bot.



Note. Screenshot captured by the author while testing the BikiUNT bot's support feature.

This Figure 11 shows the main educational menu of the BikiUNT Telegram bot, which opens after pressing the Menu button. The menu contains six sections: Easy Grammar — a grammar module with video explanations and 10-question tests, Easy Vocabulary — a selection of words by level with tasks for consolidation, Reading Comprehension — texts for reading with questions for comprehension, MOCK Tests — trial tests with gamification elements. My Progress — tracking dynamics: which topics have been covered and what is the result,  Back — return to the previous screen. This menu is designed according to the principles of microlearning and an individual trajectory: each section is activated separately, the user can study at a convenient time, sequentially moving from one module to another. Simple navigation with icons helps even students with minimal digital skills quickly navigate the structure.

Figure 11

Main training menu interface of the BikiUNT Telegram bot.



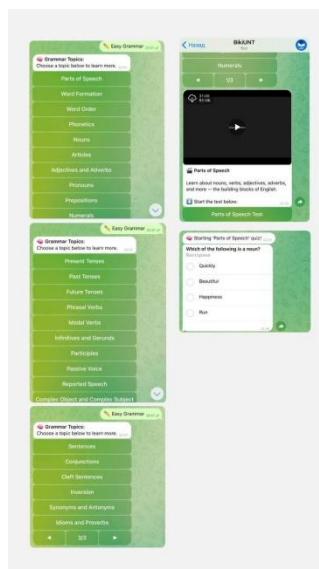
Note. Screenshot captured by the author during testing of the bot's content navigation features.

The image shows the content of one of the main training blocks of the Telegram bot — the Easy Grammar module. This section includes 26 grammar topics that cover key

sections included in the UNT structure, such as: Tenses (Present, Past, Future), Parts of Speech, Articles, Modal Verbs, Reported Speech, Passive Voice, Conditionals, as well as more complex topics: Cleft Sentences, Inversion, Complex Subject, etc. Each topic is presented interactively: when you click on the button, the user gets: A video lesson explaining the grammar topic (example: "Parts of Speech"). The Start the test button, leading to a mini-test on this topic (see bottom right in the image). The ability to immediately check your understanding after viewing the material. The test is implemented via the Telegram Quiz API and is a quiz with a choice of one correct answer, such as "Which of the following is a noun?". This approach allows not only to review the theory, but also to immediately consolidate it in practice, which makes the learning process more interactive and effective.

Figure 12

"Easy Grammar" module interface and interaction flow in the BikiUNT Telegram bot.



Note. Screenshot created by the author during functionality testing of the grammar module in the bot.

In the Easy Vocabulary section, the user is offered to choose one of three levels: Elementary, Pre-Intermediate or Intermediate, to practice vocabulary corresponding to their level of English proficiency. This approach supports the principle of personalized learning,

helps students work with material of appropriate complexity and improve their vocabulary gradually.

Figure 13

Vocabulary module interface with level selection



Note. Screenshot created by the author during functionality testing of the grammar module in the bot.

In the Reading Comprehension section, students can select the level of text difficulty — Elementary, Pre-Intermediate, or Intermediate as shown in the Figure 14. This allows each user to complete reading tasks that are appropriate for their language level. After reading a short text, the bot offers a series of comprehension questions, which helps develop analytical, interpretive, and logical thinking skills.

Figure 14

Reading Comprehension module interface with level selection

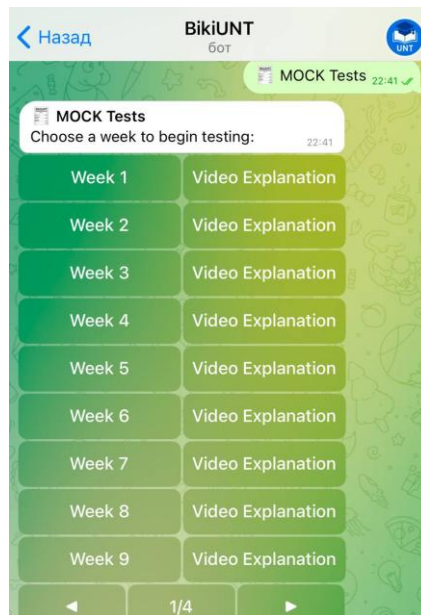


Note. Screenshot created by the author during functionality testing of the grammar module in the bot.

The Figure 15 shows the MOCK Tests module, which is a schedule of weekly mock tests designed for systematic preparation for the UNT in English. Each week includes not only a test, but also a video commentary explaining the errors, which increases awareness and the quality of assimilation of the material. The user can take tests by week, receiving feedback and recommendations. Buttons allow you to conveniently navigate through the sections, and video explanations create the effect of the teacher's presence.

Figure 15

MOCK Tests module interface in BikiUNT bot

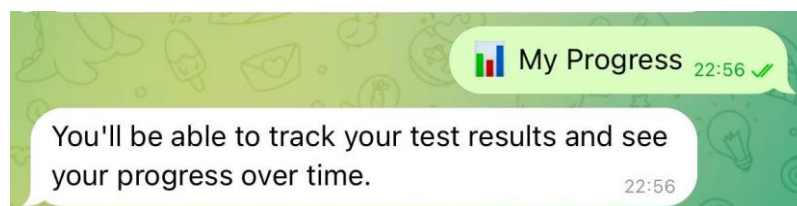


Note. Screenshot created by the author during functionality testing of the grammar module in the bot.

The Figure 16 shows the My Progress feature, which allows students to track their test results and see their overall progress over time. This helps build self-regulation skills, increases motivation, and allows students to tailor their study strategy to their individual performance. These visualizations encourage a more conscious approach to learning and develop learning autonomy.

Figure 16

Tracking academic progress in the BikiUNT bot



Note. Screenshot created by the author during functionality testing of the grammar module in the bot.

3.4 Research Participant and Tools

The target audience was 20 students in grades 10–11 from Dostyq Private School with experience in preparing for the UNT. Participants were selected voluntarily. The study was conducted remotely through a questionnaire created on the Google Forms platform. The questionnaire for students included questions about how convenient it was to use the Telegram bot (interface, navigation), an assessment of the usefulness of each module (on a scale from 1 to 5), questions about which sections were most in demand (grammar, vocabulary, reading, trial tests, progress tracking), an open-ended question: "What would you like to improve in the Telegram bot?"

3.5 Data Collection and Analysis

The survey was conducted throughout the week. Students received links to the Telegram bot and Google questionnaire. After getting to know the bot, they were asked to fill out a feedback form. Quantitative analysis included Calculating average scores for each module, Identifying the most popular bot functions, Graphically displaying preferences using tables. Qualitative analysis included thematic classification of open-ended responses (navigation, content, design, wishes), Identifying frequently occurring suggestions for improvement (e.g., "add a listening section" or "increase the volume of tests"), and Describing typical feedback examples.

3.6 Ethical and Organizational Aspects

The study was conducted in accordance with basic ethical standards: participants gave voluntary consent; all information is anonymous; the results are used exclusively for educational and scientific purposes. Participants were given the opportunity to refuse participation at any stage.

3.7 Limitations

The study focuses solely on user experience and perception, without taking into account objective verification of the results of exam preparation. Also, the sample is limited

in size and geography, the Telegram bot was used for a short period of time (up to 2 week), the questionnaires do not take into account all possible scenarios of use (for example, in offline schools).

CHAPTER 4

Results

As part of this study, a pilot test of the functionality of a Telegram bot was carried out, created to assist schoolchildren in self-preparation for the Unified National Testing (UNT) in English. Taking into account the limited resources that students often face, especially in remote areas, a critical step was to understand how effective, easy to use and applicable such a digital tool can be in practice.

One survey was conducted for this purpose: among 10th-11th grade students who tested the Telegram bot for a short period of time, whose point of view provides the opportunity for a more in-depth assessment of the prospects for introducing the bot into the educational process. Survey focused on identifying the strengths and weaknesses of the tool, as well as collecting recommendations for its further improvement.

This chapter is devoted to the analysis of the data obtained. It will consider the students' responses - their feedback, ease of use of the bot, assessment of individual modules and motivational factors.

4.1 Quantitative Responses of Students

Table 1

Demographic Information about the students

Question	Category	Frequency (n)	Percentage (%)
Grade	10th Grade	8	40.0
	11th Grade	12	60.0
Time allocated for preparation for the UNT in English	< 1 hour	4	20.0
	1–2 hours	3	15.0
	3–4 hours	5	25.0
	> 5 hours	8	40.0

Using Telegram for Educational Purposes	Yes	5	25.0
	No	15	75.0

Note. This table presents the demographic characteristics of the students who participated in the survey.

The majority of participants were 11th-grade students (60%). Regarding time spent on English UNT preparation, 40% of the students reported studying more than 5 hours weekly. While a quarter of students (25%) had previously used Telegram for educational purposes, the majority (75%) had not.

Table 2

Students' Perceived Convenience of Using Mobile Apps and Telegram Bots for Learning English

Category	Frequency (n)	Percentage (%)
1	0	0.0
2	2	10.0
3	2	10.0
4	6	30.0
5	12	60.0

Note. This table illustrates how students rated the convenience of using mobile applications and Telegram bots for learning English on a 5-point Likert scale, where 1 indicated "very inconvenient" and 5 indicated "very convenient."

Most respondents (60%) found the use of such tools very convenient.

Table 3

Digital Platforms Frequently Used by Students for Learning English

Digital Platforms	Frequency (n)	Percentage (%)
Telegram-bot & YouTube	5	25.0
Private tutor & YouTube	4	20.0
Quizlet & Duolingo	3	15.0

Private tutor (used separately)	4	20.0
YouTube (used separately)	4	20.0

Note. This table presents combinations of digital platforms used by students for English learning.

Students were allowed to choose multiple options. YouTube appeared in several combinations, indicating its popularity among learners.

Table 4

Most Frequently Selected Individual Sections of the Telegram Bot

Section	Frequency (n)	Percentage (%)
Easy Grammar	20	100.0
Mock Tests	12	60.0
Reading Comprehension	9	45.0
Test Your Level	7	35.0
Info about UNT	7	35.0
Easy Vocabulary	4	20.0

Note. This table summarizes how many students selected each section of the Telegram bot as useful or preferred.

Grammar was chosen by all respondents, making it the most valued section overall.

Table 5

Students' Perceived Usefulness of the Telegram Bot

Category	Frequency (n)	Percentage (%)
1	0	0.0
2	0	0.0
3	0	0.0
4	6	30.0
5	14	70.0
Total	20	100.0

Note. This table shows students' ratings of how useful they found the Telegram bot

The majority of students (70%) rated the bot as “very useful,” indicating a positive reception of the tool.

Table 6

Impact of Gamification Elements on Student Motivation

Category	Frequency (n)	Percentage
Yes	10	50.0
No	4	20.0
Neutral	6	30.0
Total	20	100.0

Note. This table summarizes students’ perceptions of how gamification features—such as points, levels, and achievement indicators—influenced their motivation during the use of the Telegram bot.

While 50% of the respondents found these features motivating, 30% reported a neutral effect, and 20% indicated no motivational impact.

4.2 Suggestions for Improvement of the Telegram Bot

A thematic analysis of students’ responses revealed three key themes: content enrichment, gamification and interactivity, and general satisfaction.

Theme 1: Content Enrichment

Several participants emphasized the need to expand and deepen the existing content.

One student noted:

“My Progress Section бимнеген”

Another added that:

“Грамматика жағғы өте пайдалы... сол видео сабақтарға конспект қосылса жақсы болар еді”

Participants also requested more detailed vocabulary training:

“Easy Vocabulary Section-ында сөздер более глубоко үйретілсе, контекст ішінде үйретілсе зой”

Moreover, some students highlighted the importance of including information on university programs related to the English section of the UNT:

“Алдыңғы жылғы результаттардың статистикасын қосса күйімі болар еді”

Theme 2: Gamification and Interactivity

Gamification elements were seen as motivating, and several students wanted to see more:

“Көбірек ойын сияқты Section еңгізу керек”

Theme 3: General Satisfaction

Half of the students (10 out of 20) stated that no changes were necessary:

“Өзгеріс керек емес”

“Бәрі жақсы”

Others expressed overall approval:

“Күйімі бот, мектептерге бесплатно таратылса болады”

CHAPTER 5

Discussion

This section discusses the results of the pilot testing of the BikiUNT Telegram bot, aimed at helping students prepare for the Unified National Testing (UNT) in English. The discussion includes the interpretation of quantitative and qualitative data obtained during the study, their correlation with the existing theoretical base, as well as an analysis of the practical potential and limitations of the proposed solution. The main goal is to identify the significance of the Telegram bot as a digital tool that can improve the accessibility and quality of examination preparation in the context of Kazakhstan.

5.1 Perception and effectiveness of the Telegram bot by students

The survey results showed that the BikiUNT Telegram bot received a generally positive assessment from students. More than 70% of respondents described it as “very useful”, and 60% indicated that using the bot was “very convenient”. This is especially noteworthy given that 75% of participants had not previously used Telegram for educational purposes, indicating a highly intuitive and accessible interface.

The greatest number of positive reviews concerned the Easy Grammar section, which was considered the most useful by all participants (100%). This may be due to the fact that grammar is one of the key components of the UNT and requires systematic repetition and reinforcement, which is often lacking in conditions of limited study time (an average of 2 hours per week, according to Adilet.zan.kz, 2022). The video lessons offered in the Telegram bot with subsequent mini-testing made it possible to fill this gap, which is confirmed by the work of Ginting (2022) on the role of multimodal materials and cognitively optimized videos in improving memorization and comprehension of material.

5.2 Motivation through gamification and personalization

The gamification elements of the Telegram bot (points, levels, badges, progress bars) played a significant role in increasing user motivation. 50% of students reported a positive impact of gamification on their engagement in the learning process, while 30% were neutral and 20% did not feel any change. This correlates with the findings of Avenberg & Sjöblom (2021), according to which the motivational effect depends on the individual preferences of students, as well as the degree of personalization of game mechanics.

However, suggestions received from participants, such as: “The elementary element should be more interesting for students”, indicate a desire to see more dynamic and varied forms of interaction, such as quests, timers for completion, or “daily missions”. This suggests that the implementation of advanced adaptive gamification mechanics, as described in Amalia (2024), would improve the effectiveness of the bot for a wider audience.

5.3 The Importance of Multimodal and Diagnostic Components

The sections with video tutorials, diagnostic tests, and error explanations were highly rated by users. This approach is consistent with the principles of cognitive theory of multimodal learning (Sweller, 1988; Bahari, Wu & Ayres, 2023), where the load on working memory is optimized by distributing information across different channels of perception: visual, auditory, and text. A particularly important element was the interactive diagnostic test, where students could not only assess their level of readiness but also receive immediate feedback, including an explanation of errors. The “light bulb” element for additional information enhanced metacognition and facilitated reflection on the learning process, which was also noted in the works of Pérez-Paredes & Zhang (2022).

5.4 Comparison with other platforms

The BikiUNT Telegram bot has several advantages over existing solutions such as Duolingo, Quizlet, and even specialized national platforms such as EnemPrep in Brazil. The table below provides a comparative comparison:

Table 7

Comparison of BikiUNT and Other Digital Platforms for English Exam Preparation

Platform	UNT Adaptati on	Gramma r Coverage	Gamificatio n	Video Explanatio n	Personalizatio n	Offlin e Acces s
BikiUNT	Full	Strong	Moderate	Yes	Partial	Yes
Duolingo	No	Limited	High	None	Strong	No
Quizlet	No	Moderate	Low	None	No	Partial
EnemPrep	No	Limited	Moderate	None	Yes	No

Note. This table compares the features of BikiUNT with popular language learning platforms (Duolingo, Quizlet) and a national exam prep system (EnemPrep). Evaluation criteria include adaptability to UNT, inclusion of grammar content, gamification level, use of video, personalization capacity, offline functionality.

As can be seen, the Telegram bot is a unique combination of functionality adapted to national standards and the real needs of students. Its advantages are particularly pronounced in the context of Kazakhstan, where there is a shortage of qualified teachers and limited educational resources in rural areas (Kassymova et al., 2025).

5.5 Limitations and opportunities for scaling

Despite the positive results, the study has a number of limitations. It covered a small sample (20 students) from one school, and testing was conducted over a limited period (two weeks). Also, data on objective academic performance was not taken into account, which does not allow for a definitive assessment of the impact of the Telegram bot on the UNT results.

Nevertheless, high engagement, positive feedback and specific suggestions for improvement (e.g., “show last year's results”) indicate the potential for scaling the project across the country. The use of the Telegram bot as an EdTech tool for schools in remote

regions, where access to tutors and preparatory courses is limited, seems particularly promising. Its integration with government platforms or LMS could enhance the digital transformation of Kazakhstani education.

CHAPTER 6

Conclusion

This study set out to design, implement, and evaluate BikiUNT, a Telegram-based educational chatbot created to support Kazakhstani high school students in preparing for the Unified National Testing (UNT) in English. In doing so, the research addressed several contemporary challenges facing the national education system: unequal access to quality preparation resources, lack of motivation among learners, limited classroom hours, and the scarcity of customized exam-oriented digital tools, particularly for rural and underserved regions.

The pilot phase of BikiUNT, conducted with a small but diverse group of students, provided encouraging evidence of its effectiveness. The bot was not only well-received in terms of usability and perceived usefulness, but it also filled a critical gap in the local EdTech landscape by offering localized, exam-specific, and cognitively optimized content. More than 70% of the participants rated the bot as “very useful,” and all of them identified the grammar module as the most helpful component. This aligns with the known difficulty students face when tackling grammar-related tasks in the UNT format.

Importantly, the study highlighted the multimodal design of the bot — combining short video lessons, interactive grammar tests, and immediate feedback — as a key factor in learner engagement and comprehension. These findings are consistent with modern theories of multimedia learning, which emphasize the value of reducing cognitive load through multiple input channels (visual, auditory, and textual). Additionally, the built-in diagnostic test and use of feedback tools (like the “light bulb” icon for explanations) supported the development of metacognitive awareness and self-regulated learning — attributes essential for high-stakes exam preparation.

From a motivational perspective, gamification features such as point systems, badges, and progress tracking were appreciated by half of the users. However, qualitative feedback suggests the need for more personalized and adaptive gamified mechanisms to cater to different learner profiles. Suggestions from students — including the inclusion of listening practice, vocabulary tracking, and historical data from previous UNT cohorts — underscore the demand for an even more comprehensive and interactive experience.

Furthermore, a comparative analysis with globally known platforms (e.g., Duolingo and Quizlet) confirmed that BikiUNT is uniquely tailored to the UNT context. While these platforms offer general language learning content, they lack exam alignment, local vocabulary, and assessment formats that reflect the structure of Kazakhstan's educational system. The decision to implement BikiUNT via Telegram — a platform already popular in the region — greatly enhanced accessibility and reduced technological barriers, especially in areas with poor internet infrastructure.

Nevertheless, the study is not without limitations. The sample size was relatively small ($n = 20$), geographically restricted to a single school, and the testing period lasted only two weeks. These constraints mean that the findings should be interpreted cautiously and seen as exploratory rather than definitive. Moreover, no pre- and post-intervention testing was conducted to measure objective learning gains.

Despite these limitations, the implications for practice are significant. BikiUNT demonstrates that simple, low-cost digital solutions can yield meaningful improvements in exam preparation — particularly when designed with the needs of local learners in mind. Its scalability, modularity, and adaptability make it a suitable candidate for national-level implementation, potentially as a supplement to traditional instruction or as part of state-backed educational platforms.

In conclusion, BikiUNT represents a promising fusion of pedagogical innovation and accessible technology. By leveraging Telegram's simplicity, integrating multimedia learning strategies, and aligning closely with exam standards, the bot offers more than just an additional study tool — it redefines how standardized exam preparation can be delivered in low-resource settings. Future developments should aim to expand the bot's functionality, support multiple subjects, and incorporate adaptive learning systems. If supported through institutional channels or public-private partnerships, BikiUNT has the potential to become a national model for smart, inclusive, and localized digital education.

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Appendix A

Approval of the SDU Research Committee

DECISION:

1. The research work of Aigerim Anuarbekova, «Development of a mobile application for preparation for English language of UNT» is conditionally approved but based on addressing those comments (revised changes must be sent to rethics@sdu.edu.kz email);

Appendix B

Informed Consent Form for Parents



Title of Research: “Development of a mobile application for preparation for English Exam at tUnified National Testing (UNT)”

Researcher: Aigerim Anuarbekova, Graduate Student

Department of Language Teacher Education, SDU University

Purpose of the Study: Your child is invited to participate in a research study that aims to get perception of a Telegram chatbot designed to help students prepare for the Unified National Testing (UNT) in English. The goal is to improve accessibility to digital learning tools and enhance students’ exam readiness using an interactive, user-friendly platform.

What Participation Involves: If you agree, your child will be asked to:

- Use the BikiUNT Telegram bot during a 2-week testing period;
- Complete a short pre-survey and post-survey on their experience and opinions;
- Allow anonymous data on their interactions (e.g., module usage, test scores) to be collected for analysis.

Benefits: Your child may benefit from improved understanding of English grammar and test strategies through the use of the chatbot. The findings may also contribute to improving digital educational tools across schools in Kazakhstan.

Risks: There are no known physical or emotional risks associated with this study. All data will be collected anonymously and used solely for academic purposes.

Confidentiality: All information collected will be kept strictly confidential. Your child’s name or identity will not be revealed in any report or publication. Participation is completely voluntary, and your child can withdraw at any time without any consequences.

Contact Information: If you have any questions about this study or your child’s rights as a participant, please contact:

- Aigerim Anuarbekova
- Email: darkhanqyzy.a@gmail.com
- Phone: 87780992644

Parental Consent Form

I, the undersigned, have read and understood the information provided above. I voluntarily agree to allow my child to participate in this research study.

Student's Full Name: _____

School/Class: _____

Parent/Guardian's Name: _____

Signature of Parent/Guardian: _____

Date: _____

Appendix C

Interview Questions for Students

Құрметті оқушы!

Бұл сауалнама сіздің ағылшын тілінен ҰБТ-ға дайындалуыңыздағы BikiUNT Telegram-ботының тиімділігін бағалауға бағытталған. Жауаптарыңыз құпия сақталады және тек ғылыми мақсатта қолданылады.

1. Сіз қай сыныпта оқисыз?

- 10-сынып
- 11-сынып

2. Ағылшын тілі бойынша ҰБТ-ға аптасына қанша уақыт дайындаласыз?

- 1 сағаттан аз
- 1–2 сағат
- 3–4 сағат
- 5 сағаттан көп

3. Бұған дейін Telegram немесе Telegram-ботты білім мақсатында қолдандыңыз ба?

- Ия
- Жоқ

4. Сіз ағылшын тілін оқытуда мобильді қосымшалар мен Telegram-боттарды қолдануға қаншалықты ыңғайлы деп ойлайсыз?

- 1 – Өте ыңғайсыз
- 2 – Ыңғайсыз
- 3 – Орташа
- 4 – Ыңғайлы
- 5 – Өте ыңғайлы

5. Қай цифрлық платформаларды жиі қолданасыз? (бірнешеуін таңдауға болады)
YouTube

- Duolingo
- Quizlet
- Жеке репетитор
- Telegram-бот
- Басқа (көрсетіңіз): _____

6. Telegram-боттың қай бөлімдері сізге көбірек ұнады? (бірнешеуін таңдауға болады)

- Грамматика
- Сөздік
- Оқу (Reading)
- Тест тапсырмалары (Mock tests)
- Прогресс трекері
- Деңгей анықтау
- ҰБТ туралы ақпарат

7. Бұл бот қаншалықты пайдалы деп ойлайсыз?

- 1 – Мүлдем пайдасыз
- 2 – Пайдалы емес
- 3 – Орташа
- 4 – Пайдалы
- 5 – Өте пайдалы

8. Геймификация (ұпай, деңгей, жетістік жұлдыздары) сіздің ынтаңызды арттырды ма?

- Иә
- Жоқ
- Бейтарап

9. Telegram-ботты жетілдіру үшін қандай ұсыныс айтасыз?

- Жауабыңызды төменде жазыңыз: