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ORGANIZING EFFECTIVE INDEPENDENT LEARNING THROUGH VIRTUAL TEACHERS AND CHATBOTS

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Annotation: This article analyzes the impact of virtual teacher and chatbot technologies on the learning process in the modern digital education environment, as well as the theoretical and practical aspects of organizing effective independent learning through them. It also highlights the potential of AI-based virtual teachers and chatbots to enhance students' learning efficiency.
Keywords: virtual teacher, chatbot, independent learning, artificial intelligence, digital education, learning efficiency.

In today's era of globalization and digital transformation, new challenges are emerging for the education system. In particular, the role of artificial intelligence (AI) technologies in organizing effective independent learning and personalizing students' educational processes is rapidly increasing. Virtual teachers and chatbots provide an interactive, convenient, and flexible form of education, taking teacher–student communication to a new level.

In traditional education, the teacher plays a central role, while in digital education this role can partially be performed by virtual teacher and chatbot systems. They make it possible to assist students 24/7, answer questions, check independent assignments, and manage the learning process efficiently.

The Concept and Advantages of Virtual Teachers

A virtual teacher is a digital system based on artificial intelligence algorithms that automates some of the functions of a real teacher. For example:

- Assessing a student's knowledge level and recommending suitable learning content;
- Conducting lessons in an interactive format;
- Providing an individualized learning approach;
- Monitoring and analyzing student performance.

Virtual teachers are widely used in global education systems through platforms such as ChatGPT, Google Tutor, and Khanmigo (Khan Academy AI). They serve as important tools for reducing teachers' workload, digitalizing the learning process, and increasing students' motivation.

The Role of Chatbots in Education

A chatbot is a software system that communicates with users in natural language. In the educational process, chatbots perform the following functions:

- Acting as a 24/7 consultation system for students;
- Providing explanations for lessons and assignments;
- Organizing tests and exercises automatically;
- Delivering analytical data to teachers.

For instance, Duolingo chatbots have automated the language learning process, while chatbots on Coursera and edX platforms assist students with educational course navigation.

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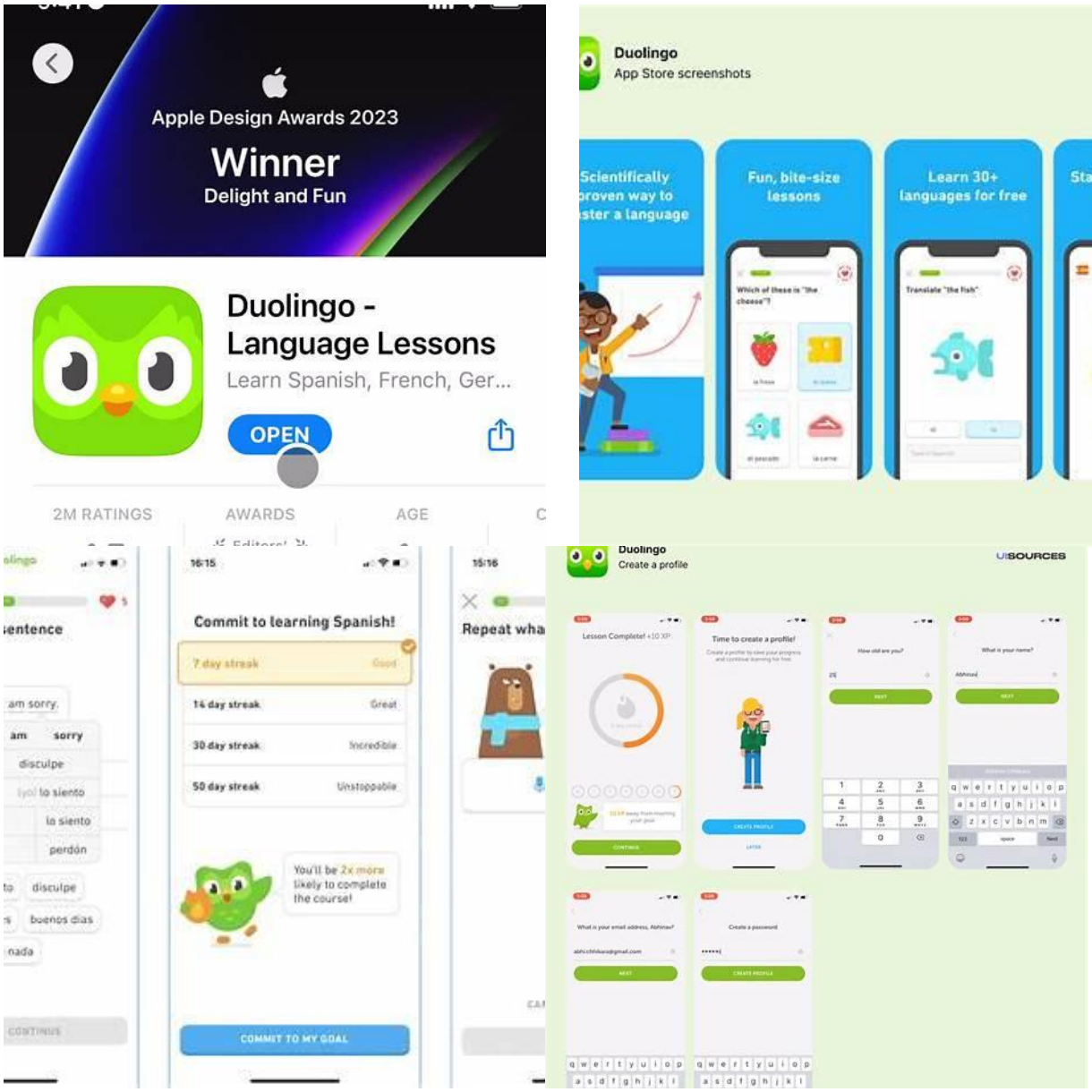
With the help of chatbots, students can ask questions and receive answers at any time, which significantly enhances the effectiveness of independent learning.



"What is Duolingo?"

Duolingo (Duolingo, Inc.) is an **educational technology (edtech) company** that primarily provides a **smartphone and web application for language learning**. The app allows users to learn **over 40 languages** through various activities such as speaking, reading, listening, and writing.

Duolingo also offers **certification tests**, such as the **Duolingo English Test (DET)**. Its **business model** is **freemium**, meaning that some features are free while additional services are paid.

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Main Functions and Methodology

Duolingo incorporates several components of language learning:

Various languages: English, Spanish, French, German, and many others.

Gamification elements: points (XP), levels, streaks (consecutive learning days), and rewards — these elements serve to motivate users.

Adaptive System: adjusts the level of difficulty based on the user's mistakes.

Duolingo English Test (DET): an online English language certification exam.

Additional Courses: some platforms also offer extra courses in fields such as music and mathematics.

Advantages

Free access: many features are available for free, expanding educational opportunities.

Encourages motivation and consistency: gamification and the "streak" system inspire users to study continuously.

Short, manageable lessons: each exercise is brief, allowing users to dedicate just a few minutes per day.

Personalization: adaptive algorithms tailor lessons to the learner's individual needs.

Wide accessibility: suitable for different languages, age groups, and learning needs.

Limitations and Drawbacks

Duolingo has limited opportunities for speaking practice and free conversation, which means users need to engage in additional real-life speaking exercises. However, its gamification system can sometimes be distracting — some users may focus more on earning rewards and points rather than on genuine learning. Moreover, the lack of contextual and in-depth grammatical explanations makes it difficult to fully understand complex grammar structures. In addition, due to limited interactivity and the absence of human involvement, Duolingo cannot completely replace the feedback, advice, and clarification provided by a real teacher. The presence of advertisements in the free version and the restriction of certain key features to paid access also create some limitations for the user experience.

Academic Research and Scientific Aspects

Data related to the Duolingo platform has been widely used in research on language learning modeling, knowledge-tracing algorithms, and personalization processes. Studies have also examined the misuse of gamification, revealing that reward and ranking systems can sometimes distract learners from their main educational goals.

Integration of Duolingo into the Education System and Future Prospects

When integrated with virtual teacher and chatbot systems, Duolingo's methods can be effectively applied in independent learning. With the help of artificial intelligence, courses can be developed more quickly — for example, in 2025, Duolingo introduced 148 new language courses using generative AI. The company promotes its "AI-first" strategy to expand its capabilities and enhance efficiency. Moreover, several universities and institutions now accept the Duolingo English Test (DET), which increases the significance of online language certifications.

The Importance of Virtual Teachers and Chatbots in Organizing Independent Learning

Independent learning is a process in which a student develops, analyzes, and applies knowledge autonomously. Virtual teachers and chatbots enhance this process in the following ways:

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1. **Individualized approach:** they provide learning materials tailored to each student's knowledge level.
2. **Increased motivation:** interactive Q&A activities and gamification elements make learning more engaging and enjoyable.
3. **Performance monitoring:** the system automatically analyzes students' learning activities and provides personalized recommendations.
4. **Time efficiency for teachers:** automated assessment and feedback systems reduce the teacher's workload.

Practical Application of Virtual Education Systems

Virtual education technologies are being gradually introduced into Uzbekistan's education system. For instance, **distance learning courses** have been implemented through the **ZiyoNET** platform, while locally developed **AI-based bots** such as **EduMarket** and **UzEduAI** play an important role in making the learning process more interactive. Moreover, **chatbot integrations** are being incorporated into university platforms such as **Moodle**, **Google Classroom**, and **Microsoft Teams**.

These systems are significant in **digitalizing the independent learning process**, **automating quality control**, and **improving learning efficiency**. As a result, students' abilities to engage in self-learning, apply knowledge in practice, and perform analytical thinking are further enhanced.

Conclusion

Virtual teacher and chatbot technologies are ushering in a new stage in the education system. They not only make teachers' work easier but also create a convenient and personalized learning environment for students. To organize effective independent learning, it is essential to integrate these technologies into the educational process, train teachers in digital competencies, and develop platforms adapted to local conditions.

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