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The Effectiveness Of The "Lab Rotation" Model Within Hybrid Learning For Developing Language Skills In Graduating Students

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Annotation: This study explores the implementation of the Lab-Rotation model within hybrid education to support effective teaching and learning in schools, particularly for foreign language instruction. The model integrates traditional classroom lessons with computer lab sessions, offering students an interactive and flexible learning environment. It enhances student motivation, improves academic outcomes, and provides targeted support for both underperforming and advanced learners. The research highlights the practical feasibility of applying this model in Uzbek schools, considering existing infrastructure and government initiatives aimed at professional development for teachers. Furthermore, the Lab-Rotation approach facilitates individualized learning pacing, interactive feedback, and continuous knowledge assessment using digital technologies. The model's applicability extends beyond natural sciences to humanities subjects such as English, contributing to the comprehensive development of language skills. Overall, the Lab-Rotation model demonstrates significant potential to improve student engagement, mastery of subject matter, and preparation for higher education and competitive academic environments.
Keywords: Lab-Rotation model, hybrid learning, foreign language teaching, interactive learning, student motivation, individualized learning, digital technologies, professional development, assessment, Uzbekistan education system.

Currently, hybrid learning models are gaining increasing popularity due to their ability to introduce diversity, creativity, critical thinking, and efficiency into the educational process. These models have proven particularly effective in the context of English as a Foreign Language (EFL) instruction, where they have shown a positive impact on students' learning outcomes. We believe that such approaches serve as powerful tools in engaging learners in practical and meaningful learning experiences.

A more in-depth analysis of hybrid learning models reveals several key types, including the rotation model, the flex model, and enriched virtual models. Furthermore, within these primary categories, various sub-models can be identified. Supporting the perspective of researcher Friesen[1], we emphasize the importance of the flipped classroom, station rotation, and lab rotation models. According to some sources, the hybrid learning approach can be categorized into four main models: station rotation, lab rotation, flipped classroom, and individual rotation (see Figure 1).

[1] Friesen, N. (2012). *Report: Defining blended learning*. Retrieved July 11, 2025, from https://www.normfriesen.info/papers/Defining_Blended_Learning_NF.pdf

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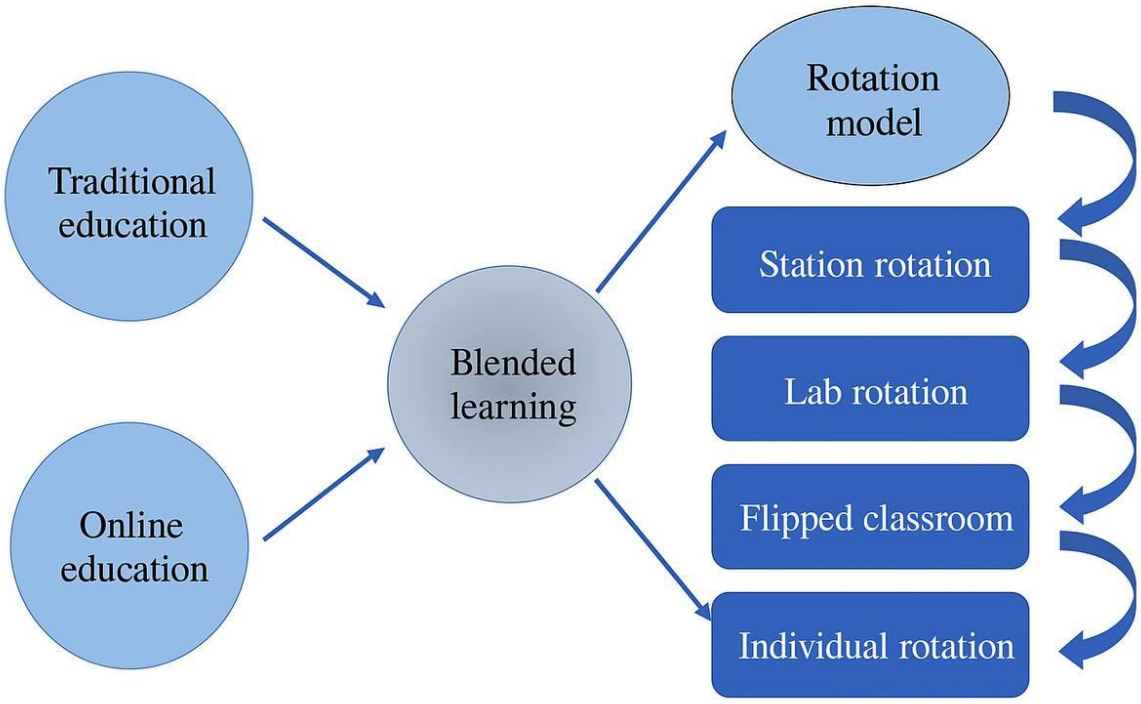

Figure 1. Sub-models of the Rotation Model

The rotation model refers to an instructional approach in which students rotate between different learning modalities—either according to a fixed schedule or at the teacher's discretion—within the framework of a subject (e.g., mathematics). Crucially, at least one of these modalities must involve online learning. The other components may include small-group or whole-class traditional instruction, collaborative projects, one-on-one tutoring sessions, as well as paper-and-pencil-based assignments.[2]

During the course of our research, we observed that the sub-models of rotation—namely *Station Rotation*, *Lab Rotation*, *Flipped Classroom*, and *Individual Rotation*—have been defined in a variety of ways by different scholars. At the same time, we have aimed to formulate and articulate our own interpretations of these models from an academic perspective.

As noted by Walne M.B., the *Station Rotation* model is implemented entirely within the classroom environment. Based on teacher-defined instructions and time intervals, students move sequentially from one station to another. The number of stations and the specific activities at each may vary depending on the instructional objectives; however, at least one online station must always be included.[3]

According to Staker and Horn (M.B.), the station rotation model typically involves at least three distinct stations: one led by the teacher, another designed for pair or small group work, and a third—crucial for its classification as a hybrid learning model—which involves online instruction.[4]

Andreeva N.V. and colleagues[5] argue that the station rotation model is one of the most widely implemented approaches and is recognized by many educators as one of the most effective instructional technologies for both primary and secondary school settings.

As Xolmirov B. points out, in the station rotation model, the classroom is divided into various stations or learning centers, each offering a different type of activity or learning experience.

[2] Christensen C. M., Horn M. B., Staker H. Is K-12 Blended Learning Disruptive? An Introduction to the Theory of Hybrids / Clayton Christensen Institute for Disruptive Innovation. — 2013. — 127 p. — P. 26.

[3] Walne, M. B. (2012). Emerging blended-learning models and school profiles. In G. H. C. Foundation (Ed.). Houston: Community Foundation.

[4] Staker, H., & Horn, M. B. (2012). Classifying K-12 blended learning. Innosight Institute.

[5] Andreeva, N. V., Rozhdestvenskaya, L. V., & Yarmakhov, B. B. (2016). Shag shkoly v smeshchannoe obuchenie [The school's step towards blended learning]. Moscow: Buki Vedi. — 282 p.

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According to our approach, the *Station Rotation* model is one of the hybrid learning technologies in which students rotate through various instructional methods within the context of a specific subject. This approach involves dividing the classroom into multiple learning stations, such as a teacher-led station, an online learning station, an individual work station, and a project-based or collaborative group work station. The number of stations may vary depending on the instructional goals and classroom conditions; however, teacher-led and online learning stations must always be present. Students are divided into small groups and rotate through the stations in a predetermined sequence during the lesson. Group compositions can be modified based on pedagogical objectives.

Moran J.M. and colleagues emphasize that in this instructional setup, students are expected to acquire foundational theoretical and practical knowledge of the topic prior to attending the in-person session. This approach is known as the *Flipped Classroom* model. In this model, the teacher's role goes beyond simply delivering content; instead, students are encouraged to think critically, ask questions, and actively engage in classroom discussions. As a result, learners tend to feel more comfortable, classroom engagement increases, peer-to-peer interaction improves, and the overall effectiveness of the lesson is enhanced.[6]

As noted by Zvereva E.V.[7], the flipped classroom model stands out as an effective technique in foreign language instruction. According to the researcher, this model offers several significant advantages. Notably, it allows for more efficient use of class time by shifting the focus toward hands-on activities that reinforce previously acquired theoretical knowledge. In addition, it enables educators to tailor learning materials—such as instructional videos and presentations—to match students' age, proficiency level, and professional needs.

In his methodological guide, Xolmirov B. defines flipped classroom teaching as a reversal of the traditional approach. Instead of delivering new content during class time and assigning homework for practice, learning materials are provided to students prior to the lesson. This allows students to engage with the content at their own pace, freeing up valuable class time for more interactive and engaging activities.[8]

Building upon the aforementioned scholarly views and insights from local researchers, we conclude that the effectiveness of the flipped classroom model lies in its emphasis on discussion, idea exchange, and practical assignments within small groups, rather than passive lecture listening. Students strive to produce a tangible outcome during the lesson based on their pre-acquired theoretical knowledge. Undoubtedly, this approach encourages active participation and fosters deeper understanding.

According to our analysis, the individual rotation model represents an innovative approach aimed at personalizing the learning process by addressing the unique needs of each student. In this model, learners move through various stations according to individualized schedules created either by the teacher or by specialized algorithms, often integrated within online platforms. Unlike other rotation models, students are not required to visit every station; instead, they participate only in activities outlined in their personalized learning plans or "playlists." While this model may superficially resemble the station rotation model, it is distinguished by its individualized nature. The learning content and activities provided to each student are tailored based on their previously recorded outcomes and aligned with their personal mastery levels.

Foreign researchers, including Joji R.M. and others[9], describe the lab rotation model as a form of hybrid learning that combines traditional face-to-face instruction with online activities and laboratory experiments. Pedagogical approaches can be understood as methodological frameworks guiding the harmonious use of certain ideas, concepts, and techniques by educational institutions or teachers in their pedagogical practice.[10]

In summary, pedagogical approaches refer to the adapted strategies and methodologies employed to achieve the goals and objectives of the teaching process. Specifically, the lab rotation model, as a type of blended

[6] Moran, J. M., Masetto, M. T., & Behrens, M. A. (2013). Novas tecnologias e mediação pedagógica. Papirus.

[7] Zvereva E.V. Model of the flipped lesson (Flipped Classroom) as one of the methods of teaching a foreign language // Innovation and multicompetence in teaching and learning foreign languages, Moscow: RUDN, 2016. Page 446-456.

[8] Kholmirov, B. (2024). *Improving the learning process based on flipped classroom technology: A methodological guide*. Tashkent: Yetakchi Nashriyoti. — 32 p.

[9] Joji, R. M., Kumar, A. P., Almarabheh, A., Dar, F. K., Deifalla, A. H., Tayem, Y., ... & Shahid, M. (2022). Perception of online and face to face microbiology laboratory sessions among medical students and faculty at Arabian Gulf University: a mixed method study. BMC Medical Education, 22(1), 411.

[10] https://milliycha.uz/ru/pedagogik-yondashuv/

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learning, encourages students to alternate between traditional classrooms and laboratory environments.[11] This approach particularly enhances the interest of graduating school students in their lessons and foreign language learning, creating optimal conditions for their preparation for higher education. During the rotation, learners engage in various educational activities, including lectures, discussions, online lessons, virtual simulations, and hands-on experiments conducted in laboratory settings. This multifaceted approach, which accounts for diverse learning styles and advantages, offers students opportunities for active participation, inquiry-based learning, and collaborative problem-solving.[12] One of the primary motivations for implementing the lab rotation model is to overcome the limitations of traditional teaching methods and leverage digital technologies to improve learning outcomes.[13]

From this perspective, by integrating online resources and virtual tools, teachers can enhance classroom instruction with interactive multimedia content, adaptive learning platforms, and real-time feedback mechanisms. According to Garrison and Kanuka, this blended approach not only increases the accessibility and flexibility of learning resources but also fosters students' independent learning and critical thinking skills.[14] Therefore, the model is designed to strengthen student engagement, support personalized learning, and promote deep understanding of subject matter.

The practical laboratory component of the Lab Rotation model plays a crucial role in bridging theoretical concepts with real-world applications. It enables students, through hands-on experiments and scientific inquiry, to explore phenomena, test hypotheses, and develop problem-solving skills within authentic laboratory settings.[15] Researcher Yao posits that this experiential learning approach facilitates a profound comprehension of chemical principles while nurturing students' curiosity and passion for scientific investigation.[16]

Furthermore, our current study aims to evaluate the effectiveness of this model not only in natural sciences but also in teaching social sciences and humanities subjects such as English. The application of the Lab Rotation model in English language learning offers opportunities to engage students with diverse learning styles and methods, thereby promoting a comprehensive development of language skills—including listening comprehension, reading, writing, and speaking.

A review of the literature indicates that various forms of this model share a common core concept: multiple lessons are conducted in traditional classrooms (where the teacher works directly with students), while in one session, students transition to a computer lab or similar environment to work individually using computers or tablets, thereby deepening or reinforcing their knowledge (see Figure –2).

[11] Hew, K. F., & Cheung, W. S. (2017). Students' and instructors' use of massive open online courses (MOOCs): Motivations and challenges. Educational Research Review, 12, 45-58.

[12] Attardi, S. M., Barbeau, M. L., & Rogers, K. A. (2018). Improving online interactions: Lessons from an online anatomy course with a laboratory for undergraduate students. Anatomical Sciences Education, 11(6), 592-604.

[13] Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2017). Active learning increases student performance in science, engineering, and mathematics. Proceedings of the National Academy of Sciences, 111(23), 8410-8415.

[14] Garrison, D. R., & Kanuka, H. (2017). Blended learning: Uncovering its transformative potential in higher education. The Internet and Higher Education, 7(2), 95-105.

[15] Zainuddin, Z., & Halili, S. H. (2018). Flipped classroom research and trends from different fields of study. The International Review of Research in Open and Distributed Learning, 17(3), 313-340.

[16] Yao, J. (2023). Exploring Experiential Learning: Enhancing Secondary School Chemistry Education Through Practical Engagement and Innovation. Journal of Education, Humanities and Social Sciences, 22, 475-484.

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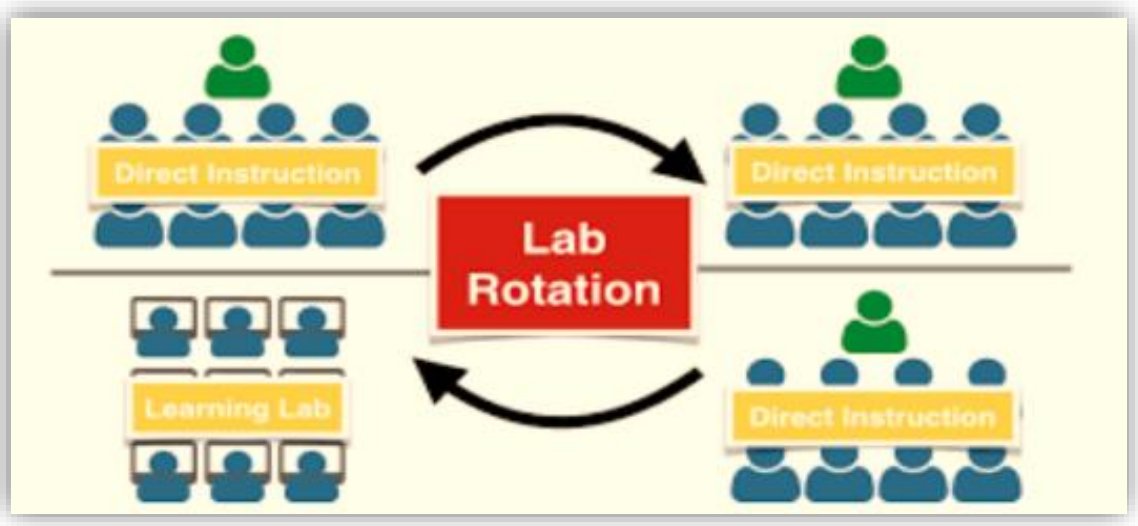

Figure 2. Lab Rotation Model

The Lab Rotation model, which integrates online learning activities with laboratory experiments, offers a complex and immersive learning environment tailored to the diverse needs and preferences of students. Tomkin and several other scholars conducted research on student-centered education in scientific, engineering, and mathematical disciplines, demonstrating the effectiveness of active learning approaches.[17] Their findings highlighted the significance of interactive learning methodologies in fostering deeper understanding of scientific concepts and promoting long-term retention.

Furthermore, Alamri and other researchers[18] explored the transformative potential of blended learning in higher education, emphasizing its capacity to support personalized learning experiences, collaborative learning environments, and student autonomy. Their studies underscored the necessity for innovative teaching strategies that leverage digital technologies to enhance student engagement and create meaningful learning experiences. Similarly, Gore (2018) investigated the motivations and challenges associated with Massive Open Online Courses (MOOCs), shedding light on students' varying learning preferences in online environments.[19] This research identified factors influencing student participation and engagement, providing valuable insights for educators aiming to design effective blended learning experiences.

By 2022, Martin and colleagues[20] conducted a comprehensive meta-analysis of online and blended learning studies, confirming the positive outcomes of these educational approaches across diverse learning contexts. Their results demonstrated that blended learning improves student outcomes, including motivation, engagement, and academic achievement. Complementing these findings, Al-Samarraie et al. (2020) examined flipped classroom methodologies, revealing their effectiveness in promoting active learning, collaborative problem-solving, and critical thinking skills. By utilizing pre-recorded instructional materials alongside in-class activities, flipped classrooms offer a flexible, student-centered approach to teaching and learning.[21]

Overall, the synthesis of empirical evidence and theoretical foundations highlights the Lab Rotation model's potential to enhance student motivation, engagement in the learning process, and academic performance within global education systems.

[17] Tomkin, J. H., Beilstein, S. O., Morphew, J. W., & Herman, G. L. (2019). Evidence that communities of practice are associated with active learning in large STEM lectures. International Journal of STEM Education, 6(1), 1-15.

[18] Alamri, H. A., Watson, S., & Watson, W. (2021). Learning technology models that support personalization within blended learning environments in higher education. TechTrends, 65(1), 62-78.

[19] Gore, H. (2018). Engagement of learners undertaking massive open online courses and the impact of design. Open University (United Kingdom).

[20] Martin, F., Wu, T., Wan, L., & Xie, K. (2022). A Meta-Analysis on the Community of Inquiry Presences and Learning Outcomes in Online and Blended Learning Environments. Online Learning, 26(1), 325-359.

[21] Al-Samarraie, H., Shamsuddin, A., & Alzahrani, A. I. (2020). A flipped classroom model in higher education: a review of the evidence across disciplines. Educational Technology Research and Development, 68(3), 1017-1051.

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Many similarities exist between the Lab Rotation model and the Station Rotation and Flipped Classroom models. The key difference lies in the fact that students in the Station Rotation model move between different stations within their designated classroom. In contrast, the Lab Rotation model involves students moving to a learning laboratory to engage in online education. While resembling the Flipped Classroom model, students in the Lab Rotation do not work from home; instead, they attend computer labs where they interact with new material (such as watching videos and answering comprehension questions), develop skills, participate in project work, and engage actively and interactively in class. The Lab Rotation model proves effective when students regularly engage in online activities.

Implementation of the Lab Rotation model can be parallel (across one or multiple subjects), requiring coordination of timetables and computer lab usage among different classes. To facilitate this, several teachers may collaborate to adopt the Lab Rotation model, create or select online instructional materials, establish a unified learning environment, and coordinate with administration to schedule one out of every three or four lessons to be held in the computer lab. Ideally, students attend one computer lab session per day.

For example, if two teachers agree to teach a total of seven lessons per week in one class, they could allocate two of these lessons to be held in the computer lab on separate days, adhering to sanitary and epidemiological regulations and aiming to enhance educational effectiveness. Each lesson includes guidance for students in each subject, and one of the teachers may accompany the students in the classroom.

Additionally, the Lab Rotation model can be implemented within a single subject, where students attend computer lab sessions once a week (for example, for English), deepening or reinforcing their knowledge. The main distinction is that students use computers only once a week in this scenario.

If you are the sole teacher in a school and wish to support students who have fallen behind through hybrid learning, and have access to a computer lab for one lesson per week, you can implement the lab rotation model in the following way: several lessons are conducted in a regular classroom, while one lesson per week is held in the computer lab. It would not be an exaggeration to say that the necessary conditions for this exist in schools throughout our country.

Specifically, the Resolution No. PQ-231 dated June 21, 2024, by the President of the Republic of Uzbekistan on “Additional measures to improve the continuous professional development system for employees of preschool and school education organizations,” and Order No. 198 dated June 28, 2024, by the Minister of Preschool and School Education, serve as clear examples of mandates aimed at ensuring the implementation of these tasks. These documents emphasize the creation of conditions to support continuous professional development and improve the professional skills of teachers, ultimately enhancing the quality of education in general secondary education institutions.

Starting from the 2024-2025 academic year, “Professional Development Days” and “Professional Development Hours” events for teachers of general secondary education institutions, organized by subject, have begun to be introduced gradually. The schedule of these events for teachers is provided in the attached Appendix (see Table 1.5).[22]

Table 1.5

[22] Annex 1 to the Order No. 246 of the Minister of Preschool and School Education of the Republic of Uzbekistan dated August 7, 2024.

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T/r	Professional development days	Subjects
1.	Monday	Social sciences (history, state and legal foundation, upbrining) teachers
2.	Tuesday	Philological sciences (ntive language and literature, Uzbek l-language) teachers
3.	Wednesday	Natural sciences (physics and astronomy, hemicry biology, geography and economics, natural sciences Science)
4.	Thursday	Exact sciences (mathematics, computer informate and information technology) teachers
5.	Saturday	Foreign languages teachers
6.	Saturday	Applied sciences (fine arts, drawing, music culture, technology, physical education, pre -conscription trainiy and primary education) teachers

As can be seen, Thursdays are free for English language teachers to use the computer and technology rooms, which creates broad opportunities to implement the Lab-Rotation model. Rational use of such conditions and the goal of developing foreign language skills among graduating students should be one of every teacher's objectives, thereby enhancing the effectiveness of this model in education.

How the Lab-Rotation Model Helps Solve Pedagogical Tasks:

1. Increasing Learning Motivation:
   The Lab-Rotation model helps increase students' interest and motivation in the learning process. Through technology and interactive methods, students gain the opportunity to learn not only via traditional lessons but also through modern tools. This strengthens their engagement and encourages them to further develop their knowledge. This is especially important for graduating students, as it provides an interactive foundation for addressing pressing issues such as preparing for university entrance exams and fostering interest in their future professions.
2. Improving Learning Outcomes:
   The rotation model is an effective way to deepen and consolidate students' knowledge. Working independently in computer labs or laboratories allows students to apply and verify their knowledge in practice. This method enables students to improve their academic performance as they can work at their own pace and better comprehend learning materials. Designing educational content and reinforcement tests based on university entrance exam questions can significantly improve school rankings nationwide.
3. Supporting Underperforming Students:
   The Lab-Rotation model is convenient for helping students who have fallen behind for various reasons. It allows learners to choose a pace that suits them and consolidate their knowledge. Additionally, teachers can identify weaknesses through video analysis and personalized feedback, helping students address them. Using computers, students can review their mistakes and work on self-improvement. Implementing this model particularly among graduating students with ICT skills enhances educational effectiveness.
4. Supporting Advanced Students' Development (Olympiad Preparation, University Entrance, and Subject Mastery):
   The Lab-Rotation model offers additional opportunities for high-achieving students. They have the chance to master more complex and in-depth knowledge. In computer labs, students can study subjects more broadly and expand their knowledge through supplementary resources. This model increases

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students' interest in the subject and effectively prepares them for olympiads and other high-level competitions. Certainly, the success of this model relies on the well-planned content developed by foreign language teachers aiming to engage graduates in higher education, careers, science, and research.

One of the main challenges of modern education systems is objectively assessing each student's knowledge level. Currently, various control methods are used. Recent innovations and hybrid teaching technologies allow positive solutions to this problem through testing knowledge levels. Nowadays, many software tools facilitate testing not only for assessment but also for systematic teaching, providing guidance and feedback during the process, timely monitoring, storing and comparing results, monitoring student progress, and collecting statistical data. This gives teachers the ability to manage students conveniently and effectively.

An important aspect of foreign language teaching is timely monitoring and accurate assessment of student knowledge. In recent years, with the development of information technologies and the widespread use of distance learning methods, the possibility to assess each student's individual knowledge level through testing has increased.

References:

1. Alamri, H. A., Watson, S., & Watson, W. (2021). Learning technology models that support personalization within blended learning environments in higher education. TechTrends, 65(1), 62-78.
2. Al-Samarraie, H., Shamsuddin, A., & Alzahrani, A. I. (2020). A flipped classroom model in higher education: a review of the evidence across disciplines. Educational Technology Research and Development, 68(3), 1017-1051.
3. Andreeva, N. V., Rozhdestvenskaya, L. V., & Yarmakhov, B. B. (2016). *Shag shkoly v smeshchannoe obuchenie* [The school's step towards blended learning]. Moscow: Buki Vedi. — 282 p.
4. Annex 1 to the Order No. 246 of the Minister of Preschool and School Education of the Republic of Uzbekistan dated August 7, 2024.
5. Attardi, S. M., Barbeau, M. L., & Rogers, K. A. (2018). Improving online interactions: Lessons from an online anatomy course with a laboratory for undergraduate students. Anatomical Sciences Education, 11(6), 592-604.
6. Christensen C. M., Horn M. B., Staker H. Is K-12 Blended Learning Disruptive? An Introduction to the Theory of Hybrids / Clayton Christensen Institute for Disruptive Innovation. — 2013. — 127 p. — P. 26.
7. Foundation (Ed.). Houston: Community Foundation.
8. Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2017). Active learning increases student performance in science, engineering, and mathematics. Proceedings of the National Academy of Sciences, 111(23), 8410-8415.
9. Friesen, N. (2012). *Report: Defining blended learning*. Retrieved July 11, 2025, from https://www.normfriesen.info/papers/Defining_Blended_Learning_NF.pdf
10. Garrison, D. R., & Kanuka, H. (2017). Blended learning: Uncovering its transformative potential in higher education. The Internet and Higher Education, 7(2), 95-105.
11. Gore, H. (2018). Engagement of learners undertaking massive open online courses and the impact of design. Open University (United Kingdom).
12. Hew, K. F., & Cheung, W. S. (2017). Students' and instructors' use of massive open online courses (MOOCs): Motivations and challenges. Educational Research Review, 12, 45-58.
13. https://milliycha.uz/ru/pedagogik-yondashuv/
14. Joji, R. M., Kumar, A. P., Almarabheh, A., Dar, F. K., Deifalla, A. H., Tayem, Y., ... & Shahid, M. (2022). Perception of online and face to face microbiology laboratory sessions among medical students and faculty at Arabian Gulf University: a mixed method study. BMC Medical Education, 22(1), 411.
15. Kholmirov, B. (2024). *Improving the learning process based on flipped classroom technology: A methodological guide*. Tashkent: Yetakchi Nashriyoti. — 32 p.
16. Martin, F., Wu, T., Wan, L., & Xie, K. (2022). A Meta-Analysis on the Community of Inquiry Presences and Learning Outcomes in Online and Blended Learning Environments. Online Learning, 26(1), 325-359.

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17. Moran, J. M., Masetto, M. T., & Behrens, M. A. (2013). Novas tecnologias e mediação pedagógica. Papirus.
18. Tomkin, J. H., Beilstein, S. O., Morphew, J. W., & Herman, G. L. (2019). Evidence that communities of practice are associated with active learning in large STEM lectures. International Journal of STEM Education, 6(1), 1-15.
19. Walne, M. B. (2012). Emerging blended-learning models and school profiles. In G. H. C.
20. Yao, J. (2023). Exploring Experiential Learning: Enhancing Secondary School Chemistry Education Through Practical Engagement and Innovation. Journal of Education, Humanities and Social Sciences, 22, 475-484.
21. Zainuddin, Z., & Halili, S. H. (2018). Flipped classroom research and trends from different fields of study. The International Review of Research in Open and Distributed Learning, 17(3), 313-340.
22. Zvereva E.V. Model of the flipped lesson (Flipped Classroom) as one of the methods of teaching a foreign language // Innovation and multicompetence in teaching and learning foreign languages, Moscow: RUDN, 2016. Page 446-456.