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MOOCS AND THE FLIPPED APPROACH IN FOREIGN LANGUAGE LEARNING: INCREASING STUDENT ENGAGEMENT

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Abstract. In the context of rapid digitalization and global interconnectedness, proficiency in foreign languages has become an essential competency for engineers and IT specialists. According to UNESCO (2023), over 65% of technical students in Europe and Asia engage in online self-directed learning. Nevertheless, only 30–35% achieve sustained progress, revealing a significant gap between digital literacy and effective language acquisition. This study investigates the integration of massive open online courses (MOOCs) and the inverted classroom approach (flipped classroom) to enhance foreign language learning among technical students. The research examines multiple dimensions of engagement—cognitive, behavioral, social, and emotional—alongside factors influencing self-regulated learning, critical thinking, and learner autonomy.

From a scientific perspective, this study addresses a critical gap: there is currently no systematic evaluation of the impact of hybrid instructional models on the language proficiency of technical students. Practically, the findings inform the development of blended curricula, digital pedagogy strategies, and corporate language programs for engineers. The study introduces a “digital bilingual engagement model,” a framework designed to foster bilingual competence while leveraging digital tools to support autonomous, collaborative, and contextually relevant learning in Kazakhstan’s engineering education.

The methodology synthesizes empirical studies from 2020 to 2024, compares hybrid learning models, and systematizes scaffolding strategies. Evidence suggests that combining MOOCs with inverted classroom methodologies enhances motivation, improves academic performance, and cultivates teamwork and self-directed learning skills. Key challenges include varying student readiness and potential cognitive overload.

This research provides the first comprehensive assessment of hybrid learning effects on all engagement dimensions in technical education, contributing to both pedagogical theory and applied practice. Implications extend to universities, digital platforms, and policymakers designing national programs. Future directions involve integrating adaptive AI systems, intelligent chatbots, AR/VR environments, and virtual laboratories to deliver personalized, career-oriented language learning experiences that align with professional and technological demands.

Keywords: massive open online courses (MOOCs), flipped classroom, foreign language learning, student engagement, engineering and technical education, blended learning models, digital pedagogy, educational innovation

Introduction

In the 21st century, English is a universal tool for professional and academic communication. It plays a key role in engineering and technical fields: knowledge of the language is necessary for working with scientific literature, participating in international projects, publishing articles in indexed journals, and interacting with the global community. Employers increasingly require graduates of technical fields to not only possess professional competencies, but also to be fluent in English. However, it is precisely this category of students that presents a contradiction: despite their high level of digital literacy, their engagement in the language learning process often remains low, and searching for new pedagogical solutions is a pressing task. This study is interdisciplinary in nature, combining approaches from pedagogy, digital technology, and engineering education. This synthesis allows us to view language learning not as isolation, but as part of the training of technical specialists for professional and scientific communication.

Modern engineering training practices show that traditional teaching methods no longer meet the expectations of students who are accustomed to the digital environment. The most effective technologies are those that allow real production processes to be simulated: virtual simulators, simulation environments, digital twins of equipment, and platforms for collaborative engineering design. The introduction of such tools changes the nature of educational activities—instead of passively absorbing material, students have the opportunity to analyze data, test hypotheses, and create prototypes in digital format. Open laboratories, where digital models are combined with rapid prototyping, also play an important role, making learning more practice-oriented and increasing motivation. This system is complemented by adaptive educational platforms that allow students to build individual trajectories and maintain engagement even for those who experience difficulties in the traditional learning scheme. This set of solutions provides a deeper understanding of engineering processes and makes the educational environment significantly more attractive to the current generation of technical specialists.

In modern language education, the role of digital resources is becoming increasingly important, making the learning process more dynamic and attractive to students. Teachers are increasingly turning to gaming services such as Kahoot! and Quizizz, as well as adaptive platforms such as Duolingo and Lingvist, which allow them to select tasks according to the student's level and track their progress using statistical tools. Massive open online courses (MOOCs) occupy a special place, since, as D. Koller and A. Ng note in their research on Coursera and Stanford Online, MOOCs provide access to a wide range of materials and allow students to independently determine the trajectory and intensity of their learning [1]. However, the works of J. Sokolik and R. Godwin-Jones, published in the journals *Language Learning & Technology* and *IRRODL*, emphasize that despite all the advantages of MOOCs, problems remain: a high percentage of unfinished courses, a low level of engagement, and limited effectiveness in developing spontaneous oral speech due to the predominance of written and automated forms of interaction. The most consistent results are demonstrated by a blended

approach, in which MOOCs are supplemented with live online discussions, project assignments, and game-based methods; this allows for the creation of a richer and stimulating educational environment and increases motivation to learn English [6].

The flipped classroom model [2] involves students studying theory independently at home using video lectures, online assignments, and interactive platforms, while classroom time is used for practical exercises, discussions, role-playing, and project work. This approach is particularly effective in English language teaching, as it allows students to focus on actively practicing all language skills: speaking, listening, reading, and writing, creating real-life communication situations, and developing critical thinking. Experience shows that students become more engaged, learn the material better, and show initiative, while teachers can work individually on difficult topics and keep the group motivated. The advantages include active student participation, the development of communication and critical thinking skills, the ability to study the material at a comfortable pace, and more effective use of class time. Disadvantages include high demands on student self-organization, significant preparation by the teacher, dependence on digital infrastructure, and the risk that some students will not be able to master the material on their own. When organized competently, the flipped classroom promotes better language acquisition and the formation of practical communication skills [7].

The combination of MOOCs and the flipped classroom open up a wide range of opportunities for learning English, but it is associated with many difficulties. First, students may experience information overload due to the large volume of video lectures, online assignments, and materials, which makes it difficult to grasp key ideas. Second, this approach requires a high degree of self-organization and motivation: without regular homework, the effectiveness of learning decreases. Third, teachers must spend a significant amount of time and effort preparing quality content, monitoring progress, and providing individual support to students. In addition, successful implementation depends on technical infrastructure, including stable access to the internet, platforms, and devices. Finally, differences in student preparation can create difficulties: some students may fall behind, requiring adaptation of assignments and a differentiated approach. Thus, while the integration of MOOCs and the flipped classroom [7] increase student autonomy and engagement, it requires careful planning, support, and workload management. The combination of MOOCs and the flipped classroom open vast opportunities for learning English, but it comes with several challenges. First, students may experience information overload due to the large volume of video lectures, online assignments, and materials, which makes it difficult to grasp key ideas. Second, this approach requires a high degree of self-organization and motivation: without regular homework, the effectiveness of learning decreases. Third, teachers must spend a lot of time and effort preparing quality content, monitoring progress, and providing individual support to students. In addition, successful implementation depends on technical infrastructure, including stable access to the internet, platforms, and

devices. Finally, differences in student preparation can create challenges: some students may fall behind, requiring adaptation of assignments and a differentiated approach. Thus, while the integration of MOOCs and the flipped classroom increase student independence and engagement, it requires careful planning, support, and workload management [14].

Today's students learn in a highly technologically rich environment, which significantly affects their engagement in the learning process [13]. The use of digital tools, such as video lectures, online platforms, interactive applications, and mobile services, helps maintain attention and interest while providing opportunities for individualized learning. Engagement is influenced by both technological factors (availability and quality of online resources, interactivity of assignments, convenience of platforms) and psychological and social factors (level of motivation, ability to self-organize, interaction with teachers and peers). Engagement is traditionally viewed through four components: behavioral (activity and participation in tasks), cognitive (attention and intellectual effort), emotional (interest and satisfaction), and social (interaction with teachers and classmates) [12]. In contrast, agentic engagement reflects the student's proactive position, their ability to independently manage the learning process, set goals, plan actions, and make decisions about how to master the material. Thus, agentic engagement combines elements of all other types, but emphasizes personal initiative and responsibility, which is directly related to the development of autonomy, critical thinking, and long-term academic success [13]. Despite the growing interest in digital learning models, the impact of MOOC integration and the flipped classroom on various aspects of student engagement in technical fields remains understudied. Most research has focused on the humanities and economics, creating a research gap in the field of engineering education.

This approach allows for a systematic assessment of the impact of MOOC and flipped classroom integration on student engagement, because each mechanism reflects a separate but interrelated aspect of the learning experience. The motivational level assesses the extent to which students feel autonomy, interest, and intrinsic motivation to learn the material; this can be measured using questionnaires, self-assessment scales, and analysis of activity in online courses. The cognitive level shows how effectively students process information and manage their workload; it is assessed through comprehension tests, analysis of task completion, and observation of errors or difficulties. The social level reflects the quality of interaction between students and with the instructor, participation in discussions, collaborative projects, and forums; This is recorded through observation, activity on discussion platforms, and network analysis of communication. The combination of these three mechanisms provides a complete picture of engagement, identifies the strengths and weaknesses of technology integration, and allows for the adjustment of teaching methods to improve academic success and student independence.

The study aims to identify ways to increase the engagement of technical students by combining MOOCs and the flipped classroom in English language learning. Strategies for developing cognitive engagement through material

optimization and interactive tasks, behavioral engagement through active participation in projects and discussions, social engagement through collaboration and interaction with the instructor, and emotional engagement through support and encouragement of success are considered. Attention is paid to agentic engagement, which encourages students to independently manage their learning and track their progress, thereby increasing motivation, participation, academic performance, and independence.

The scientific novelty of the study lies in the fact that, for the first time in the context of engineering education in Kazakhstan, the impact of MOOC integration and the flipped classroom on various aspects of student engagement is comprehensively analyzed. The authors propose the Blended Autonomy Model (BAM) concept, where the central element is agency engagement, which combines cognitive, social, and motivational mechanisms.

The peculiarity of this study is that it is conducted in Kazakhstan, where English is a key professional tool in a bilingual engineering environment. Unlike developed countries with uniform access to digital resources, Central Asia continues to face problems of digital inequality, which makes the study of MOOC integration and the flipped classroom particularly relevant and practically significant. In the global scientific literature, the effectiveness of these models is studied in detail in both the humanities and STEM disciplines [5], with most studies noting an increase in student engagement but also identifying difficulties in maintaining motivation and the risks of information overload. At the same time, in Central Asia, including Kazakhstan, research is local in nature and mainly concerns the humanities. Consequently, there is little data on the impact of hybrid learning models on engineering and technical students in a bilingual environment. This study aims to fill this gap by providing new insights into the application of MOOCs and the flipped classroom in technical education.

Materials and methods

This study was based on a comprehensive model of student engagement proposed by Fredricks, Blumenfeld, and Paris (2004), which considers the cognitive, behavioral, and emotional aspects of student participation in the learning process. The study added a component of agentic engagement, reflecting students' initiative, their ability to independently plan and manage their learning activities, and actively interact with the teacher. Zimmerman's (2000) concept of self-regulated learning was used as an additional theoretical guide, emphasizing the importance of independent control and assessment of learning progress. This integration of theoretical approaches made it possible not only to track the dynamics of engagement but also to assess the impact of modern educational technologies on their various components.

The study aimed to test three hypotheses: the use of a combination of MOOCs and the flipped classroom promotes increased student engagement; the level of engagement correlates positively with academic performance; and B1-level students demonstrate a more pronounced increase in engagement compared to A2-level students.

A quasi-experimental design with parallel groups, including quantitative and qualitative methods of analysis, was used to experiment. The study involved 72 second- and third-year students majoring in engineering and information technology at a university in Kazakhstan. The average age of the participants was 19.8 years, and the training took place in a bilingual environment. The students had an English level of A2–B1, and the distribution across groups was comparable, as confirmed by statistical testing.

The experiment was conducted over one semester (14 weeks) and included two complementary components. The online part consisted of completing the MOOC “English for Academic Purposes” on the Coursera platform, which included modules with video lectures, practical assignments, and tests. Each module took 2-3 hours per week to complete. The classroom part was based on the flipped classroom principle, where students performed pair and group assignments, project work, and role-playing discussions, which allowed them to reinforce the material and develop collaboration skills. The control group was taught traditionally, with lectures and practical exercises under the guidance of a teacher.

To measure engagement, an adapted questionnaire by Fredricks et al. (2004) was used, with a section on agentic engagement covering cognitive, behavioral, emotional, and agentic aspects of participation. Academic performance was assessed using a standardized language test that included reading, writing, and speaking. Additionally, data was collected from the online platform, including module completion, number of test attempts, forum activity, and time spent working. Qualitative data were collected through interviews, focus groups, and systematic observations using checklists, and the accuracy of interpretations was verified using member checking. The research procedure consisted of four stages: in the first week, entrance testing and questionnaires were conducted; from the 2nd to the 12th week, educational models were implemented; in the 13th week, final testing and repeat questionnaires were conducted; and the final week was devoted to interviews and analysis of observations.

Quantitative data were processed using SPSS and R with t-tests, ANOVA, correlation analysis, and multiple regression models. Qualitative data underwent thematic analysis using inductive coding and coding-consistency checks by independent experts. Key limitations of the study include the lack of complete randomization, differences in access to digital resources, and the voluntary nature of student participation. All procedures complied with local ethics committee requirements and international standards, including the Declaration of Helsinki and GDPR. Participants provided written informed consent and could withdraw from the study at any time. To ensure transparency and reproducibility, anonymized data, class protocols, and analysis scripts will be posted in an open OSF repository with a DOI assignment.

Results

Initial analysis showed that the control and experimental groups were statistically comparable on all baseline characteristics ($p > 0.05$), allowing the

recorded changes to be considered a result of the educational intervention. At the end of the semester, it was the experimental group that demonstrated a sustained positive shift in most indicators of engagement and academic performance.

Table 1 shows the average values of student engagement across four components, and Figure 1 clearly illustrates their dynamics.

Table 1. Average values of student engagement (on a Likert scale, 1–5)

<i>Engagement component</i>	<i>Experimental (before)</i>	<i>Experimental (after)</i>	<i>Control (before)</i>	<i>Control (after)</i>
Cognitive	3.1	3.9	3	3
Agent	2.8	3.7	2.9	3.1
Behavioral	3.2	3.6	3.1	3.3
Emotional	3.0	3.5	3.1	3.2

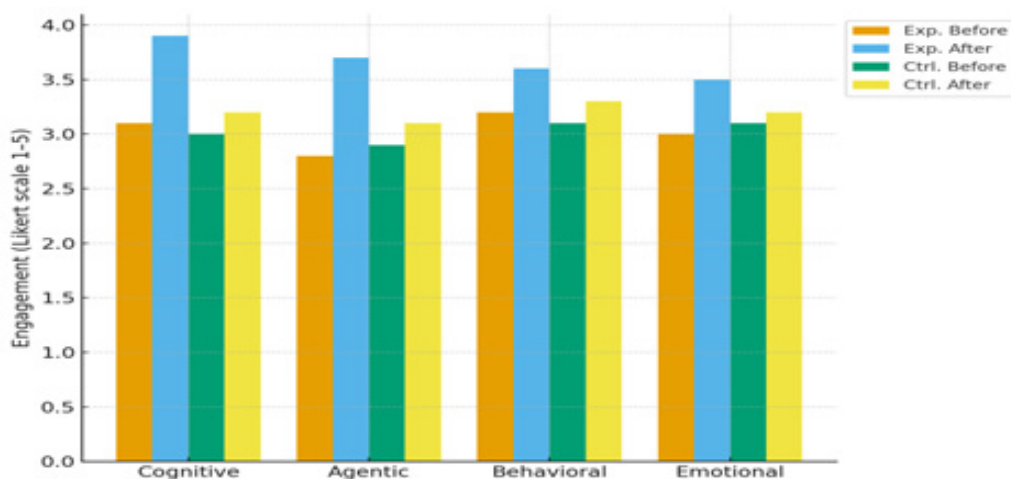


Figure 1- Comparative dynamics of student engagement in the experimental and control groups

As can be seen from the data, the most significant changes occurred in the cognitive and agent components (the differences were more than 0.7 points, $d > 0.80$), which corresponds to Cohen's criteria for a large effect [4]. This indicates that students not only became more actively involved in learning activities but also demonstrated greater initiative in managing their own learning. In the control group, the increase was minimal and statistically insignificant, confirming the hypothesis about the advantage of the combined model. These results echo the conclusions of Lee (2023), who also noted that the flipped classroom combined with digital resources contributes to the development of students' cognitive activity [10].

If engagement indicators reflect the internal dynamics of learning motivation [3], then language test results allow us to assess their practical impact in terms of academic achievement. Table 2 shows the average scores for three key types of speech activity, and Figure 2 shows their dynamics.

Table 2. Average scores for language skills (0–100)

<i>Skill</i>	<i>Experimental (before)</i>	<i>Experimental (after)</i>	<i>Control (before)</i>	<i>Control (after)</i>
Reading	58	72	57	63
Writing	54	69	55	61
Spoken language	56	71	57	62

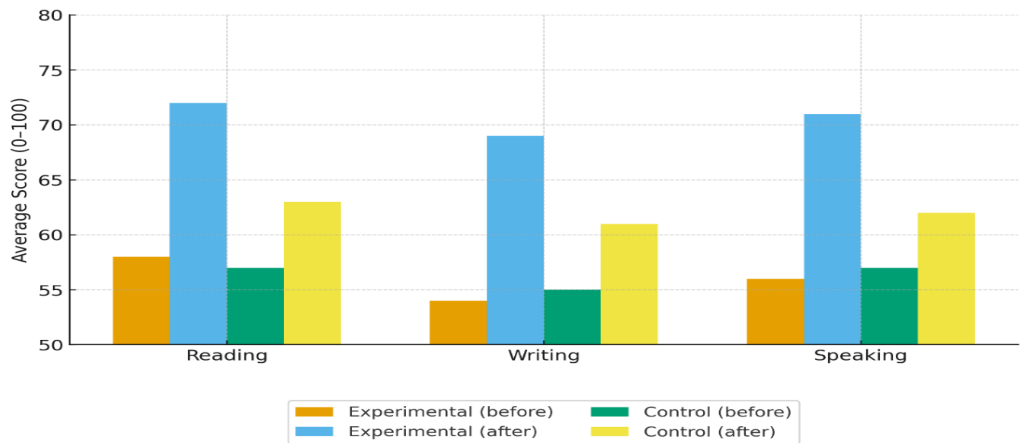


Figure 2- Dynamics of student performance in language skills

The data show that the overall increase in the experimental group was 15.4 points, which corresponds to a one-level advancement on the CEFR scale (from A2 to B1). The greatest progress was recorded in writing, which confirms the effectiveness of preliminary work with MOOC materials. In the control group, the increase was within 6–7 points and was not statistically significant. These results are consistent with the findings of Sun & Chen (2024), which emphasized that writing skills are most sensitive to flipping learning [11].

These data indicate that B1-level students made more active use of the new model, showing more initiative in discussions and project work. However, even A2-level students demonstrated positive dynamics, which indicates the universality of the proposed approach.

Correlation analysis confirmed that there is a strong positive relationship between engagement and results in English ($r = 0.64$; $p < 0.001$). The cognitive ($r = 0.59$) and agentive ($r = 0.55$) components made the greatest contribution. The visualization is presented in Figure 3.

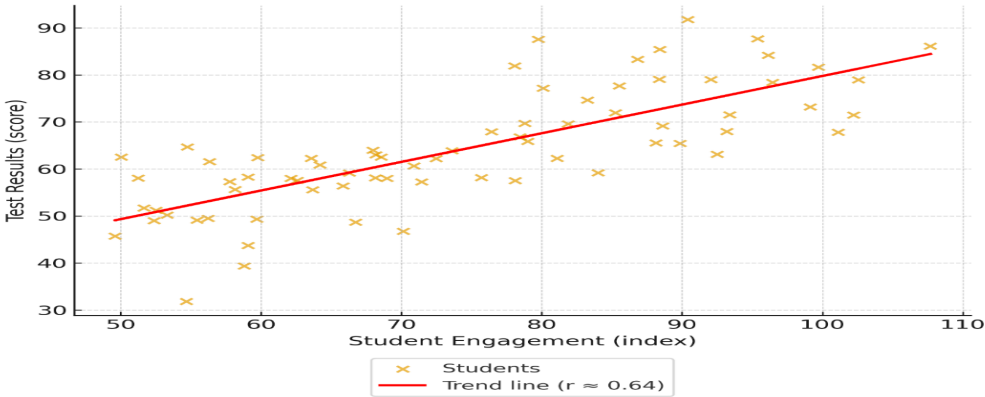


Figure 3- Correlation between student engagement and language test results

The analysis of student activity on online forums proved to be equally important, as it reflects their actual initiative. In the experimental group, 68% of students actively participated in discussions, 14% showed moderate activity, and 18% remained passive. The data is visualized in Figure 4.

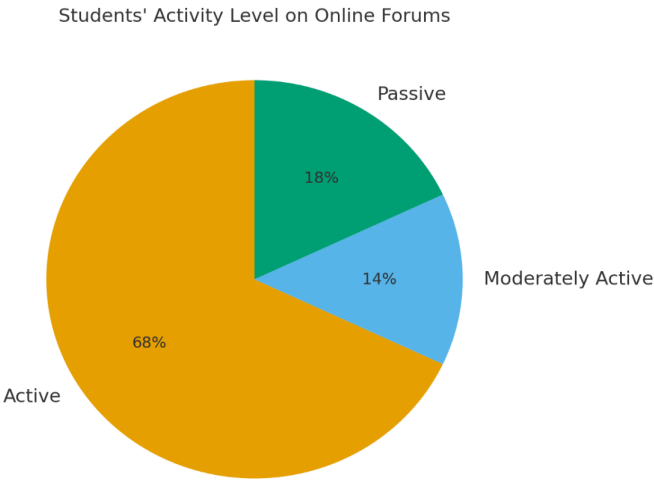


Figure 4 - Level of student activity on online forums

It is noteworthy that it was the most active participants demonstrated the greatest increase in agentic engagement and academic performance. The same students who completed assignments formally and avoided interaction showed much more modest progress. These data confirm the observations of the OECD (2024), which indicated that the level of involvement in online discussions is directly related to academic success.

Along with the positive dynamics, certain limitations were also identified: about 12% of students did not complete the course in full, which may be due

to reduced academic motivation or technical factors, including unstable internet access. To verify the reliability of the conclusions, a sensitivity analysis was conducted—an analytical procedure aimed at assessing the stability of the results when the sample composition changes. The analysis showed that excluding data from students who did not complete their studies did not lead to significant changes in key indicators of engagement and academic performance. This suggests that the identified effects are stable and reduces the risk of distortion of conclusions due to incomplete data.

Thus, the results not only confirm the hypotheses put forward but also demonstrate that the proposed learning model has significant potential for the bilingual educational environment in Kazakhstan. For the first time, it has been shown that the combination of MOOCs and the flipped classroom is effective even in conditions where English is not the native language but a foreign language for the professional training of students in engineering and technical specialties.

Discussion

The integration of massive open online courses (MOOCs) and the “flipped classroom” technology have significantly increased the engagement of engineering and technical students, primarily in the cognitive and agentic spheres, reflecting increased intellectual activity and the development of self-regulation skills. This is evidenced by the observed indicators of increased activity in completing assignments, independent search for solutions, and participation in educational activities. This dynamic is consistent with self-determination theory, which posits that autonomy and intrinsic motivation are key predictors of academic success.

An unexpected result was that emotional engagement did not increase as significantly as expected. Unlike in the humanities, where this component is identified as the leading one, agentic engagement proved dominant in technical environments [8]. The specifics of the bilingual context can explain this phenomenon: for students in Kazakhstan, English is a tool for professional training, and the emphasis shifts towards pragmatic initiative rather than emotional satisfaction with the process.

The data obtained confirms the relevance of the Community of Inquiry framework [12], in which social interaction and cognitive presence reinforce each other. In the study, student activity on online forums proved to be a key factor in the formation of social presence, which contributed to improved academic performance. At the same time, there was significant variability in participation: some students were actively involved in discussions, while others took a more passive position, which highlights the need to implement scaffolding strategies to ensure the involvement of all participants.

Equally important is the issue of cognitive load. According to Cognitive Load Theory [10], an excessive amount of learning material can reduce the effectiveness of knowledge acquisition. In this study, 12% of students did not complete the course, which, in addition to possible low motivation or technical limitations, may indicate an imbalance between the amount of content and the time available. This observation is also consistent with previous studies highlighting

information overload as a challenge in technology-enhanced learning. Although cognitive load was not measured directly, the course non-completion rate may indicate that content volume and workload deserve closer consideration in the design of hybrid language courses.

Subgroup analysis confirmed that B1-level students adapt more quickly to hybrid formats and demonstrate more pronounced growth in engagement. Nevertheless, positive dynamics were also observed among A2-level students, which indicates the adaptability of the proposed model. This result echoes the research of Li et al. [9], where blended learning was considered a tool for smoothing out differences in initial training.

Based on the empirical findings, we propose the Blended Autonomy Model (BAM), a conceptual framework explaining how cognitive, emotional, social, and agentic engagement interact within hybrid foreign language learning. The designation Blended Autonomy was chosen to emphasize the interaction between blended instructional design and the development of learner autonomy observed in the present study. The model suggests that agentic engagement functions as the central mechanism linking cognitive, emotional, and social engagement with learning outcomes, rather than treating these dimensions as independent constructs (Fig. 5).

The limitations of the study include a limited sample (one university), the absence of multilevel analysis (e.g., HLM), and the possible influence of cultural factors, such as the traditionally high role of the teacher in the post-Soviet educational system. To extend the validity of the findings, future research should include multi-university samples, longitudinal projects, and comparative analyses with other countries in Central Asia and Eastern Europe.

The practical value of the results lies in the possibility of using the proposed model in the development and implementation of national blended learning strategies. Given the heterogeneous digital infrastructure and differences in access to educational resources in Kazakhstan, the integration of MOOCs and the flipped classroom approach represents a potentially scalable strategy for improving the quality of foreign language instruction across higher education institutions.

Future refinement of the proposed Blended Autonomy Model (BAM) may involve the integration of learning analytics to monitor students' engagement and learning trajectories in real time. Learning analytics enables the collection, analysis, and interpretation of digital learning data, allowing instructors to identify individual learning difficulties and provide timely pedagogical support. Combined with adaptive artificial intelligence, AR/VR technologies, and virtual laboratories [15], these tools may further enhance personalized foreign language instruction for engineering students and strengthen the effectiveness of hybrid learning environments.

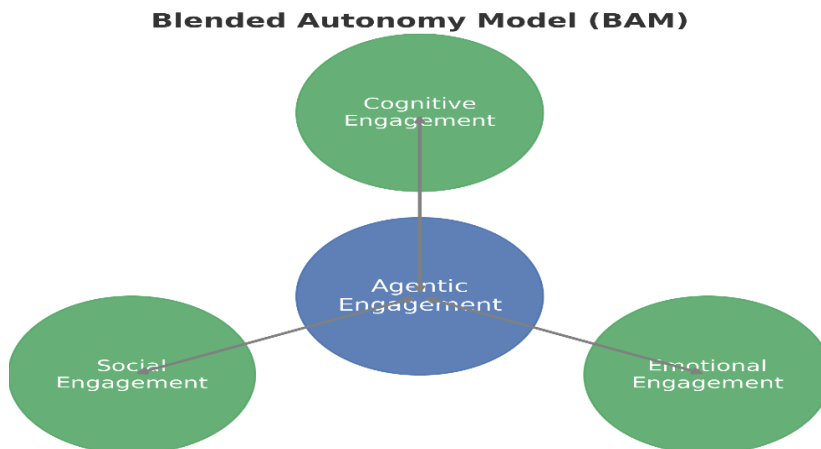


Figure 5- Blended Autonomy Model (BAM) of student engagement in hybrid foreign language learning

Figure 5 summarizes the conceptual relationships identified in this study. Agentic engagement is presented as the central mechanism linking cognitive, emotional, and social dimensions of engagement within the proposed hybrid learning framework.

Thus, the study contributes to the global discussion on digital education by offering an original context, the bilingual environment of a developing country. Taken together, the findings suggest that balancing cognitive load, fostering agentic engagement, and strengthening social interaction are key conditions for effective hybrid foreign language learning.

Conclusion

The study showed that integrating massive open online courses and flipping classroom technology into a bilingual engineering and technical environment does not merely improve academic performance but also brings about a broader shift in understanding the nature of the educational process. The model demonstrated that it is precisely agentic engagement, combining cognitive effort, initiative, and social interaction, that becomes a key condition for students' transition from passive information reception to active and autonomous management of their own learning.

The scientific novelty of this study lies in the development of the Blended Autonomy Model (BAM), which complements existing interpretations of Self-Determination Theory and the Community of Inquiry framework by explaining how agentic engagement functions as the central mechanism linking cognitive, behavioral, emotional, and social engagement in hybrid foreign language learning. The methodological value of the research lies in the use of digital traces of student activity (forums) and sensitivity analysis, which made it possible to increase the reliability of data interpretation and set a new vector for empirical research in the field of digital pedagogy.

The practical significance of the results obtained is particularly relevant for Kazakhstan and countries with similar educational realities, where English serves as a professional tool and access to digital resources remains uneven. The proposed model combines the scalability of MOOCs with the interactive potential of the flipped classroom, providing a practical framework for the modernization of foreign language education in engineering universities. Moreover, the results fit into the global discussion about the future of engineering education, demonstrating that effective solutions can be developed not only in developed systems but also in the educational spaces of developing countries. The interdisciplinary nature of the research highlights its contribution to pedagogy and digital didactics, as well as to the practice of engineering education.

At the same time, the identified limitations—differences in the level of access to digital educational resources, potential risks of cognitive overload, and the specifics of established pedagogical practices—require further consideration and gradual adaptation of the proposed model. These factors point to the need for flexible design of blended learning formats, taking into account institutional and contextual diversity.

Prospects for further research are linked to expanding the empirical base through multi-university samples, conducting longitudinal studies, and more active use of learning analytics tools and the introduction of artificial intelligence technologies, AR/VR environments, and virtual laboratories. The implementation of these directions will allow us to move from local pedagogical experiments to the formation of sustainable and personalized educational ecosystems.

The authors' contribution lies in the theoretical justification and conceptualization of the Blended Autonomy Model as an analytical framework that adapts existing pedagogical approaches to the conditions of bilingual technical education. The proposed model broadens the interpretation of hybrid learning by emphasizing the role of agentic engagement as a key mechanism for the effectiveness of mixed formats.

Unlike typical studies conducted in developed countries, this work considers the specifics of Central Asia, where the bilingual educational environment and digital inequality create unique conditions for the application of hybrid models.

Thus, this work goes beyond empirical confirmation of the effectiveness of hybrid learning and sets a new direction in the development of bilingual engineering education. In the context of global digitalization, hybrid formats are no longer auxiliary pedagogical techniques but have become a strategic vector of educational transformation. The Blended Autonomy Model demonstrates that it is the synergy of autonomy, digital flexibility, and global communication that can become the foundation for training a new generation of specialists capable of operating effectively in a transnational professional environment and shaping the educational future of the 21st century.

REFERENCES

- [1] Fernández-Otoya F. The impact of the MOOC based on the flipped classroom methodology on information competence and learning motivation // *Frontiers in Education*. – 2025. – Volume 10, Issue 2. – pp. 144-158. URL: <https://doi.org/10.3389/feduc.2024.1447127>

[2] Kong W. Research on flipped classrooms in foreign language education: A systematic review of Chinese academic journals, 2011-2021 // *Humanities and Social Sciences Communications*. – 2024. – Volume 11, Issue 1. – pp. 105-120. URL: <https://doi.org/10.1057/s41599-024-03019-z>

[3] Tran Q. Flipping EFL reading comprehension classes: Students' perspectives and performance impact // *Teaching and Learning Inquiry*. – 2025. – vol. 13(1). – pp. 45-60. URL: <https://doi.org/10.20343/teachlearningqu.13.1.4>

[4] Faro M.H., El Said G.R. Improving student engagement with a flipped classroom in higher education contexts: Evidence from a quasi-experimental study // *PLOS ONE*. – 2024. – vol. 19(10). – pp. 88-104. URL: <https://doi.org/10.1371/journal.pone.0273982>

[5] Akçayır M., Akçayır G. The flipped classroom: A review of its advantages and challenges // *Computers & Education*. – 2018. – vol. 126. – pp. 334-345. URL: <https://doi.org/10.1016/j.compedu.2018.07.021>

[6] Chan V. Enhancing translation technology skills through blended MOOCs: A case study // *Frontiers in Education*. – 2025. – vol. 10(4). – pp. 215-230. URL: <https://doi.org/10.3389/feduc.2025.1613880>

[7] Khadawardi K. Evaluating medical student engagement in flipped classroom courses: A longitudinal study // *PLOS ONE*. – 2025. – vol. 20(3). – pp. 112-127. URL: <https://doi.org/10.1371/journal.pone.0280332>

[8] Huang R., Hew K.F. Implementing flipped classroom in STEM education: Student engagement and success // *Journal of Educational Technology & Society*. – 2022. – vol. 25(3). – pp. 112-124.

[9] Li J., et al. Blended learning and learner engagement: A study of technical students // *Computers & Education*. – 2024. – Vol. 185. – pp. 55-71. URL: <https://doi.org/10.1016/j.compedu.2022.104521>

[10] Lee S. The impact of flipped classroom and digital tools on cognitive engagement in engineering education // *Bulletin of Ablai Khan KazUIRandWL, Series «Pedagogical sciences»*. – Almaty, 2023. – No4(47). – pp. 67-75.

[11] Sun Y., Chen L. Flipped classroom effect on writing skills improvement in technical university students // *Bulletin of Ablai Khan KazUIRandWL, Series «Pedagogical sciences»*. – Almaty, 2024. – No1(48). – pp. 45-53.

[12] Wang X., Liu Y. Teaching strategies of the flipped classroom model for college English based on the MOOC perspective // *Bulletin of Ablai Khan KazUIRandWL, Series «Pedagogical sciences»*. – Almaty, 2024. – No2(49). – pp. 24-32.

[13] Talgatova A.B., Issayeva A.K. Scaffolding professional discourse via digital platforms: Blended learning solutions for engineering students // *Bulletin of Ablai Khan KazUIRandWL, Series «Pedagogical sciences»*. – Almaty, 2025. – No2(53). – pp. 118-132.

[14] Alibekova G.M. Integrating AI tools in flipped EFL classrooms: Enhancing learner autonomy in technical universities // *Bulletin of Ablai Khan KazUIRandWL, Series «Pedagogical sciences»*. – Almaty, 2026. – No1(56). – pp. 89-104.

[15] Fernández O.A., Saavedra J.M.M. Evaluating the effectiveness of

MOOC and flipped learning approach: A systematic review and meta-analysis
// Education Sciences. – 2025. – Vol. 15(7). – pp. 195-210. URL: <https://doi.org/10.3390/educsci15070888>

ЖАППАЙ АШЫҚ ОНЛАЙН КУРСТАР ЖӘНЕ ШЕТ ТІЛІН ҮЙРЕНУДЕГІ ИНВЕРТТЕЛГЕН ТӘСІЛ: СТУДЕНТТЕРДІҢ БЕЛСЕНДІЛІГІН АРТТЫРУ

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Аңдатпа. Қарқынды цифрландыру және жаһандық өзара байланыс жағдайында шет тілдерін меңгеру инженерлер мен IT-мамандар үшін маңызды дағдыға айналды. ЮНЕСКО (2023) мәліметтері бойынша, Еуропа мен Азиядағы техникалық мамандықтар бойынша студенттердің 65%-дан астамы өздігінен онлайн оқытумен айналысады. Дегенмен, тек 30-35 % тұрақты прогреске қол жеткізеді, бұл цифрлық сауаттылық пен тілді тиімді үйрену арасындағы айтарлықтай алшақтықты көрсетеді. Бұл зерттеу техникалық мамандықтар студенттерінің шет тілін үйрену тиімділігін арттыру үшін жаппай ашық онлайн курстарды (ЖАОК) және «төңкерілген сынып» (flipped classroom) тәсілін біріктіруді қарастырады. Зерттеу қатысудың әртүрлі аспектілерін - когнитивті, мінез-құлық, әлеуметтік және эмоционалдық, сондай-ақ оқудың өзін-өзі реттеуіне, сыни ойлауына және оқушылардың тәуелсіздігіне әсер ететін факторларды қарастырады.

Ғылыми тұрғыдан алғанда, бұл зерттеу маңызды олқылықты жояды: қазіргі уақытта гибридті оқыту үлгілерінің техникалық мамандықтағы студенттердің тілді меңгеру деңгейіне әсерін жүйелі бағалау жүргізілмейді. Нәтижелер инженерлерге арналған аралас оқу бағдарламаларын, Цифрлық педагогика стратегияларын және корпоративтік тілдік бағдарламаларды әзірлеуде пайдаланылуы мүмкін. Зерттеуде «екі тілді өзара іс - қимылдың цифрлық моделі» - Қазақстанда инженерлік білім беру саласында дербес, бірлескен және контекстік тұрғыдан өзекті оқытуды қолдау үшін цифрлық құралдарды пайдалана отырып, екі тілді дағдыларды дамытуға арналған жүйе ұсынылған.

Әдістеме 2020–2024 жылдар аралығында жүргізілген эмпирикалық зерттеулерді біріктіреді, гибридті оқыту үлгілерін салыстырады және қолдау стратегияларын жүйелейді. Қолда бар дәлелдер МООС-ты төңкерілген аудиториялық әдістермен үйлестіру мотивацияны арттырады, оқу үлгерімін жақсартады және топтық жұмыс пен өзін-өзі оқыту дағдыларын дамытады. Негізгі мәселелерге оқушылардың әртүрлі дайындығы және ықтимал когнитивті шамадан тыс жүктеме жатады.

Бұл зерттеу алғаш рет гибридті Оқытудың техникалық білім берудегі өзара әрекеттесудің барлық аспектілеріне әсерін жан-жақты бағалауды қамтамасыз етеді, бұл педагогикалық теорияны да, қолданбалы тәжірибені де ынталандырады. Нәтижелер университеттерге, цифрлық

платформаларға және ұлттық бағдарламаларды әзірлейтін саясаткерлерге қатысты. Болашақ даму бағыттарына бейімделген жасанды интеллект жүйелерін, интеллектуалды чатботтарды, кеңейтілген және Виртуалды шындық орталарын және кәсіби және технологиялық талаптарға сәйкес келетін жеке мансапқа бағытталған тілдерді үйренуге арналған виртуалды зертханаларды біріктіру кіреді.

Тірек сөздер: жаппай ашық онлайн курстар (ЖАОК), төңкерілген сынып, шет тілдерін үйрену, оқушылардың қатысуы, инженерлік-техникалық білім беру, аралас оқыту үлгілері, цифрлық педагогика, білім беру инновациялары

МООК И ПЕРЕВЕРНУТЫЙ ПОДХОД В ИЗУЧЕНИИ ИНОСТРАННОГО ЯЗЫКА: ПОВЫШЕНИЕ ВОВЛЕЧЕННОСТИ СТУДЕНТОВ

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Аннотация. В условиях стремительной цифровизации и глобальной взаимосвязанности владение иностранными языками стало важнейшим навыком для инженеров и IT-специалистов. По данным ЮНЕСКО (2023), более 65 % студентов технических специальностей в Европе и Азии занимаются самостоятельным онлайн-обучением. Однако только 30–35 % добиваются стабильного прогресса, что свидетельствует о значительном разрыве между цифровой грамотностью и эффективным изучением языка. В этом исследовании рассматривается интеграция массовых открытых онлайн-курсов (МООК) и подхода «перевернутого класса» для повышения эффективности изучения иностранного языка студентами технических специальностей. В исследовании рассматриваются различные аспекты вовлечённости - когнитивный, поведенческий, социальный и эмоциональный, а также факторы, влияющие на саморегуляцию обучения, критическое мышление и самостоятельность учащихся.

С научной точки зрения это исследование устраняет важный пробел: в настоящее время не проводится систематическая оценка влияния гибридных моделей обучения на уровень владения языком у студентов технических специальностей. Полученные результаты могут быть использованы при разработке смешанных учебных программ, стратегий цифровой педагогики и корпоративных языковых программ для инженеров. В исследовании представлена «цифровая модель двуязычного взаимодействия» - система, разработанная для развития двуязычных навыков с использованием цифровых инструментов для поддержки автономного, совместного и контекстуально релевантного обучения в сфере инженерного образования в Казахстане.

Методология объединяет эмпирические исследования, проведенные в период с 2020 по 2024 год, сравнивает гибридные модели обучения и

систематизирует стратегии поддержки. Имеющиеся данные свидетельствуют о том, что сочетание MOOK с перевернутыми аудиторными методиками повышает мотивацию, улучшает успеваемость и развивает навыки командной работы и самостоятельного обучения. Основные проблемы включают различную готовность учащихся и потенциальную когнитивную перегрузку.

Это исследование впервые дает всестороннюю оценку влияния гибридного обучения на все аспекты взаимодействия в техническом образовании, способствуя как педагогической теории, так и прикладной практике. Результаты распространяются на университеты, цифровые платформы и политиков, разрабатывающих национальные программы. Будущие направления развития включают интеграцию адаптивных систем искусственного интеллекта, интеллектуальных чат-ботов, сред дополненной и виртуальной реальности, а также виртуальных лабораторий для персонализированного изучения языков, ориентированного на карьеру и соответствующего профессиональным и технологическим требованиям.

Ключевые слова: массовые открытые онлайн-курсы (MOOK), перевёрнутый класс, изучение иностранных языков, вовлечённость учащихся, инженерно-техническое образование, смешанные модели обучения, цифровая педагогика, образовательные инновации

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