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PEDAGOGICAL STRATEGIES AND TECHNOLOGICAL TOOLS IN BLENDED LEARNING MODELS

Abstract. Modern education is increasingly turning to blended learning, combining classical and digital methods to improve the effectiveness of the educational process. This article analyzes pedagogical strategies and technical means used in blended learning models, as well as their impact on the learning process.

The purpose of the study is to identify effective pedagogical approaches and digital tools that help optimize blended learning. The article focuses on aspects such as adaptive educational technologies, multimedia tools, game elements, and individual feedback.

The work has both scientific and practical value. The theoretical significance of the study lies in the systematization of existing approaches and the substantiation of their effectiveness, and the practical significance lies in the formation of recommendations for the integration of digital tools into educational programs. The research methodology includes an analysis of scientific literature, as well as an online survey of students with experience using digital educational platforms. This method allowed us to identify current trends and preferences of students in a blended environment. The main results show that personalized learning based on the use of digital technologies contributes to increased motivation, better assimilation of material and development of independence of students. In particular, adaptive platforms, multimedia content and game methods turned out to be the most effective.

The contribution of the study is the development of a strategy for the effective implementation of pedagogical and technical tools in blended learning. The practical significance of the work is expressed in the possibility of using the obtained data when updating educational programs, developing courses and improving the qualifications of teachers.

Keywords: blended learning, pedagogical strategies, technological tools, language competence, motivation, online survey.

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Аралас оқыту үлгілеріндегі педагогикалық стратегиялар мен технологиялық құралдар

Аңдатпа. Қазіргі білім беру үдерісінің тиімділігін арттыру үшін дәстүрлі және цифрлық әдістерді біріктіретін аралас оқытуға көбірек бет бұруда. Бұл мақалада аралас оқыту үлгілерінде қолданылатын педагогикалық стратегиялар мен технологиялар және олардың оқу процесіне әсері талданады.

Зерттеудің мақсаты – аралас оқытуды оңтайландыруға көмектесетін тиімді педагогикалық тәсілдер мен цифрлық құралдарды анықтау. Мақалада бейімделген білім беру технологиялары, мультимедиа, ойын элементтері және жеке кері байланыс сияқты аспектілерге назар аударылады.

Зерттеу жұмысы ғылыми және практикалық маңызға ие. Зерттеудің теориялық маңыздылығы қолданыстағы тәсілдерді жүйелеуде және олардың тиімділігін негіздеуде, ал практикалық маңыздылық білім беру бағдарламаларына цифрлық құралдарды интеграциялау бойынша ұсыныстарды қалыптастыруда жатыр. Зерттеу әдістемесі ғылыми әдебиеттерді талдауды, сондай-ақ цифрлық білім беру платформаларын пайдалану тәжірибесі бар студенттердің онлайн сауалнамасын қамтиды. Бұл әдіс аралас ортада студенттердің қазіргі тенденциялары мен қалауларын анықтауға мүмкіндік берді.

Негізгі қорытындылар цифрлық технологияларды пайдалана отырып, жекелендірілген оқыту мотивацияны, оқуды сақтауды және оқушының дербестігін жақсартатынын көрсетеді. Атап айтқанда, бейімделген платформалар, мультимедиялық контент және ойын әдістері ең тиімді болып шықты.

Зерттеудің үлесі аралас оқытуда педагогикалық және техникалық құралдарды тиімді енгізу стратегиясын жасауда тұр. Жұмыстың практикалық маңыздылығы білім беру бағдарламаларын жаңарту, курстарды әзірлеу және мұғалімдердің біліктілігін арттыру кезінде алынған мәліметтерді пайдалану мүмкіндігінен көрінеді.

Кілт сөздер: аралас оқыту, педагогикалық стратегиялар, технологиялық құралдар, тілдік құзыреттілік, мотивация, онлайн сауалнама.

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**Педагогические стратегии и технологические инструменты
в моделях смешанного обучения**

Аннотация. Современное образование все чаще обращается к смешанному обучению, сочетая классические и цифровые методы для повышения результативности учебного процесса. В данной статье анализируются педагогические стратегии и технические средства, применяемые в моделях смешанного обучения, а также их воздействие на процесс обучения.

Цель исследования – выявить эффективные педагогические подходы и цифровые инструменты, способствующие оптимизации смешанного обучения. В статье основное внимание уделяется таким аспектам, как адаптивные образовательные технологии, мультимедийные средства, игровые элементы и индивидуализированная обратная связь.

Работа имеет как научную, так и практическую ценность. Теоретическая значимость исследования заключается в систематизации существующих подходов и обосновании их эффективности, а практическая - в формировании рекомендаций по интеграции цифровых инструментов в образовательные программы. Методология исследования включает анализ научной литературы, а также онлайн-опрос студентов, имеющих опыт использования цифровых образовательных платформ. Данный метод позволил выявить актуальные тренды и предпочтения обучающихся в смешанной среде.

Основные результаты показывают, что персонализированное обучение, основанное на применении цифровых технологий, способствует повышению мотивации, лучшему усвоению материала и развитию самостоятельности учащихся. В частности, наиболее эффективными оказались адаптивные платформы, мультимедийный контент и игровые методы.

Вклад исследования заключается в разработке стратегии эффективного внедрения педагогических и технических инструментов в смешанное обучение. Практическое значение работы выражается в возможности использования полученных данных при обновлении образовательных программ, разработке курсов и повышении квалификации преподавателей.

Ключевые слова: смешанное обучение, педагогические стратегии, технологические инструменты, языковая компетенция, мотивация, онлайн-опрос.

Introduction

Modern education is rapidly evolving under the influence of digital technologies, which necessitates the development of innovative teaching approaches and tools to enhance learning outcomes. Blended learning – a combination of traditional in-person instruction and online resources – has emerged as one of the most promising educational models [1; 2]. This model allows for flexibility, accessibility, and personalization, which are key factors for improving learner engagement and success in higher education.

Despite the growing implementation of blended learning, there is insufficient understanding of which pedagogical strategies and technological tools most effectively contribute to student motivation and language acquisition. Earlier studies focused on general aspects of online or distance learning [3], [4]; however, the dynamic integration of digital platforms, adaptive technologies, and AI-driven learning environments calls for an updated examination of the most efficient approaches in blended learning.

Research problem: Although blended learning has been widely introduced, a research gap remains regarding the identification of specific pedagogical and technological strategies that yield the most significant impact on students 'learning outcomes in foreign language education.

Research questions:

1. Which pedagogical strategies are most effective in blended learning environments for language acquisition?

2. What technological tools significantly influence student motivation and learning performance?

3. How do these strategies and tools interact to improve educational outcomes in higher education?

The purpose of this study is to identify and evaluate effective pedagogical and technological elements of blended learning and to develop practical recommendations for their integration into educational programs.

The object of the study is blended learning models in higher education.

The subject of the study is pedagogical approaches and digital technologies used in these models.

The purpose of the study is to identify the most effective pedagogical strategies and technological tools in blended learning, as well as to analyze their impact on the quality of the educational process.

Main objectives of the study:
• To review and systematize existing pedagogical strategies in blended learning.
• To determine which digital tools are most in demand among students.
• To analyze the relationship between the use of technology and the level of mastery of the educational material.
• To develop recommendations for the implementation of the most effective strategies in the educational process.

The research methodology is based on the analysis of scientific literature, a comparative study of various blended learning models, as well as an empirical study, including an online survey of students using educational digital platforms (Coursera, Moodle, Bilimland, YouTube, etc.). The obtained data will be processed using statistical analysis methods to identify key patterns.

The hypothesis of the study is that the use of certain pedagogical strategies and digital tools in blended learning improves the quality of the educational process and the level of mastery of the material by students. The relevance of the study is due to both theoretical and practical significance. From a scientific point of view, the work expands the understanding of blended learning, and from a practical point of view, it provides teachers with recommendations on the optimal choice of pedagogical approaches and digital technologies. Thus, the conducted study will identify the most effective methods of organizing blended learning, which in the future can contribute to the improvement of educational programs in higher education.

Blended learning has been the focus of extensive academic discussion since the early 2000s [1; 2]. It integrates face-to-face and online instruction to enhance accessibility and effectiveness in higher education. Recent studies demonstrate that such integration improves flexibility, personalization, and motivation among students [5; 6].

Scholars identify several key pedagogical strategies that determine the success of blended learning. Adaptive learning systems, interactive multimedia tools, and game-based learning elements have been shown to significantly improve learner engagement and comprehension [7], [8]. Tools such as Kahoot, Quizlet, and Google Classroom create an active learning environment that supports collaboration and immediate feedback [9; 10].

The role of artificial intelligence (AI) and data analytics has become increasingly relevant in recent years. Kumbo and Mero [11] revealed that AI-driven adaptive systems enhance student-centered learning by customizing content delivery. Mushtaq and Iqbal [12] demonstrated that hybrid pedagogical models combining flipped and blended learning improve student motivation and participation rates. Duterte [13] and Yadav [14] highlighted that AI-supported feedback systems promote learner autonomy, while Zhang [15] confirmed that the use of technological platforms fosters both instructional quality and skill development.

Recent empirical research (2023–2025) further emphasizes the pedagogical significance of digital assessment tools, gamification, and LMS-based instruction. Kumar et al. [6] and Santos et al. [7] proved that the combination of interactive multimedia and gamification increases students' long-

term retention. Casusol and Lasso [16] found that blended learning significantly impacts learning satisfaction, particularly when teachers integrate continuous formative feedback.

New investigations underline the transformative role of adaptive AI technologies, virtual reality (VR), and learning analytics in language education [17], [18]. Studies by Almazova [19] and Li & Huang [20] show that VR and AR simulations can strengthen intercultural competence and language immersion. Similarly, Wang [21] emphasizes that blended models supported by generative AI tools enhance individualization and peer collaboration.

In summary, the literature demonstrates that blended learning is effective when it incorporates adaptive pedagogy, interactive technology, and individualized assessment. However, continuous teacher training and the alignment of technological tools with pedagogical goals remain essential challenges for sustainable implementation.

Research methods and materials

A mixed-method approach was employed to investigate the effectiveness of pedagogical strategies and technological tools in blended learning. The study combined quantitative survey data with qualitative content analysis.

Research design.

The study was empirical and descriptive, aiming to assess students 'perceptions of various blended learning models. The main objectives were to:

– identify the most frequently applied teaching strategies;

– determine the most effective technological tools;

– evaluate student motivation and satisfaction;

– analyze correlations between pedagogical methods, technology use, and learning results.

Participants.

A total of 48 university students majoring in foreign languages participated. Respondents were selected by random sampling and had prior experience using digital learning platforms such as Coursera, Moodle, Bilimland, and YouTube.

Instrument.

A structured questionnaire consisting of 15 items was administered online. It included four thematic blocks: (1) general information; (2) pedagogical strategies (interactive tasks, adaptive learning, collaborative work); (3) technological tools (YouTube, Quizlet, Kahoot, Miro, Padlet); and (4) learner motivation and satisfaction indicators. Answers were measured using a five-point Likert scale.

Validity and reliability.

To ensure content validity, the questionnaire was reviewed by three experts in digital pedagogy. A pilot test was conducted with ten students to refine ambiguous items. Cronbach's alpha coefficient ($\alpha = 0.87$) confirmed high internal consistency. Methodological triangulation — combining survey data with open-ended responses — enhanced the reliability and credibility of the research findings. Ethical standards were maintained through informed consent and data confidentiality.

Data analysis.

Quantitative data were analyzed using descriptive statistics (percentage distribution, mean values), while qualitative responses were subjected to thematic analysis. This combination provided a comprehensive understanding of student perspectives and ensured methodological robustness.

Analysis and results

Modern education is actively introducing blended learning technologies, combining traditional methods with digital platforms. However, there are certain issues that need to be studied: Differences in student perception and interest - data analysis showed that the majority of

respondents (60.9%) preferred the South Kazakhstan Pedagogical University named after Uzbek Zhanibekov, which may indicate that students from this university are more attracted to the research topic. At the same time, the share of students from the Central Asian Innovation University (39.1%) indicates possible differences in educational approaches and the level of implementation of blended learning.

Effectiveness of blended learning - the vast majority of respondents (89.4%) noted the positive impact of this method on learning a foreign language, but 10.6% doubted it. This indicates the need for further analysis of the factors affecting the success of the implementation of this method.

Choice of educational platforms and tools - students actively use YouTube (80.9%) and Coursera (59.6%), which confirms the high demand for video content and structured online courses. However, less popular models include Flipped Classroom (12.8%) and Flex Model (4.3%), while Rotation Model is not used at all (0%). This indicates low awareness among students or poor adaptation of these models to the educational environment.

The choice of web tools – YouTube (66%), Quizlet (63.8%) and Kahoot (63.8%) – shows the importance of visual content and game-based learning. However, the low use of Miro board (6.4%) and complete lack of interest in Padlet (0%) may indicate that teachers are not actively integrating interactive tools into the teaching process.

The role of the teacher in a blended learning environment – students believe that the teacher should be not only a source of knowledge, but also a mentor who develops students' autonomy (68.1%), as well as an innovator who is well versed in digital technologies (63.8%). However, traditional roles such as cultural mediator (23.4%) and advisor (19.1%) are gradually taking a back seat.

Optimal platforms for blended learning – according to respondents, this method is most effectively implemented in universities (68.1%) and private lessons (57.4%), while general education schools (36.2%) and language centers (23.4%) are less adapted to such formats.

As part of the study, a survey was conducted among students to find out their opinions on the use of blended learning and its impact on the level of foreign language proficiency. The survey included several questions related to the university, educational platforms, tools used, as well as the role of teachers and the use of blended learning.

Question: "Which university do you study at?"

Respondents were divided into two universities: Central Asian Innovation University - 39.1% of participants.

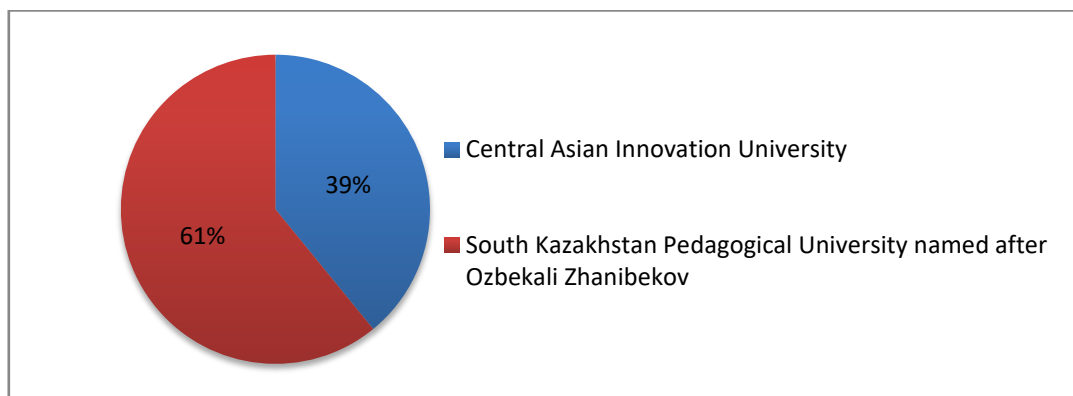NJSC South Kazakhstan Pedagogical University named after Ozbekali Zhanibekov - 60.9% of participants.

Diagram 1 – Survey participant rate

The survey participants rate in diagram 1 says that the majority of respondents are students of the South Kazakhstan Pedagogical University named after O. Zhanibekov. This may indicate a high interest of students at this university in the research topic.

Question: "Does the use of blended learning help improve foreign language proficiency?"

The respondent could choose "Yes" or "No". The results were distributed as follows: "Yes, it helps" – 89.4% "No, it does not help" – 10.6%

The vast majority of respondents considered blended learning to be an effective method of improving foreign language proficiency, which confirms the importance of combining online and offline methods.

Question: "What educational platforms or resources did you use to learn a foreign language?"

Respondents could select multiple answers. The results were distributed as follows: YouTube – 80.9% Coursera – 59.6% Bilim Land – 31.9% Flipped Classroom – 12.8% Flex Model – 4.3% Moodle – 2.1%
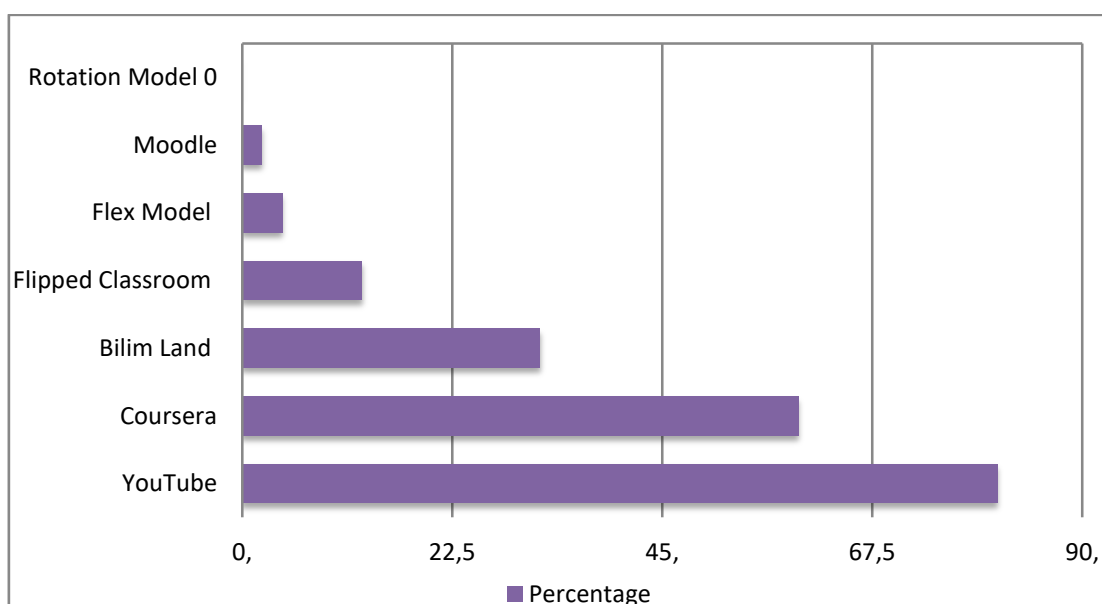

**Diagram 2 – Frequently used educational platforms and resources
for learning a foreign language**

According to diagram 2: Frequently used educational platforms and resources for learning a foreign language can be ordered in this way; Rotation Model – 0% YouTube and Coursera are the most popular among students, which indicates a high demand for online content and video courses. Models such as the rotation model are rarely used, which may indicate their low popularity or lack of awareness among students.

Question: "Which web tool do you use most often when studying?"

Respondents could select multiple answers. The results were distributed as follows: YouTube – 66% Quizlet – 63.8% Kahoot – 63.8% Miro board – 6.4% Padlet – 0%

The diagram 3 shows the result of question: *"Which web tool do you use most often when studying?"*. The most popular among web tools are YouTube, Quizlet and Kahoot, which confirms students' interest in videos, flashcards and game quizzes. Padlet was not chosen by any of the respondents, which may indicate its low awareness or integration into the educational process.
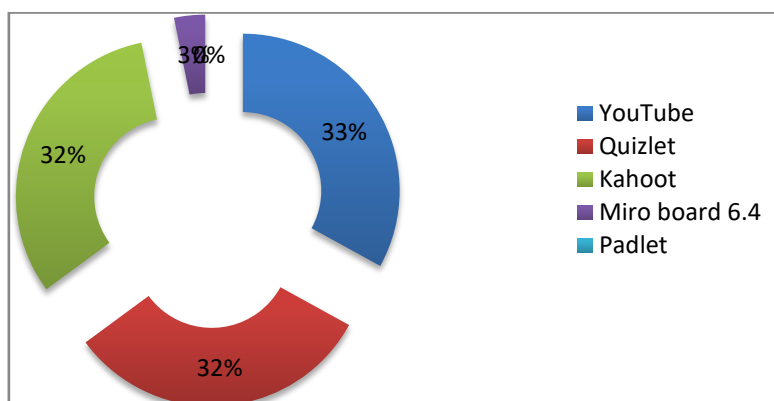
Diagram 3 – Frequently used web tool

Question: "What roles are important for a foreign language teacher today?"

Respondents could select multiple answers. The results showed the following priorities: Formative and developmental assistant – 68.1% Innovator and researcher with modern technical knowledge – 63.8% Experienced mediator and partner in the cultural education of students – 23.4% Competent consultant – 19.1% Professional creation of electronic content – 10.6% Students develop not only knowledge from a teacher, but also for independent learning. The innovative role of the teacher, including the use of digital tools, is also important.

Data analysis shows that today's students expect not only in-depth knowledge from their foreign language teachers, but also the development of independent learning skills. Innovative and technological competencies are also in demand, which highlights the importance of digital tools in the learning process. At the same time, traditional roles such as advisor and cultural guide remain important, but they impose new demands on pedagogical activity.

Question: "Where can blended learning be effectively used?"

Respondents could select multiple answers. The results were distributed as follows: In higher education institutions – 68.1% In individual lessons – 57.4% In general education schools – 36.2% In individual language schools – 23.4% Respondents consider higher education institutions to be the most suitable for using blended learning due to the possibility of combining theoretical training and practical online resources. Individual lessons are also considered an effective way to use this method. General education schools and private language centers receive less attention, which may be due to limited technical capabilities.

Thus, the survey provided valuable data that can help further develop and optimize blended learning methods to improve the quality of education.

Data analysis shows that respondents see the greatest potential for blended learning in higher education, where this format allows for the integration of academic theory with practical online resources. The high proportion of responses for private lessons also suggests that a personalized approach and digital technologies can significantly increase the effectiveness of language learning. At the same time, comprehensive schools and private language centers are rarely considered optimal platforms for this approach, which may be due to limited technical capabilities or established traditional teaching formats.

The survey results provide a deeper understanding of students' perceptions of blended learning and its impact on language acquisition.

One of the key questions in the survey was: "Does the use of blended learning help improve foreign language acquisition?" The majority of respondents (89.4%) answered positively,

confirming the effectiveness of combining online and offline methods in language learning. This indicates the need to further develop and integrate such models into the learning process.

When analyzing the educational platforms used, it was found that the most popular were YouTube (80.9%) and Coursera (59.6%). The high interest in these resources is associated with the availability of materials, the ability to choose topics, and the flexibility of learning. However, specialized models such as the Rotation Model (0%) and Flex Model (4.3%) are practically never used. This may indicate a lack of awareness among students about such methods or their lack of integration into the curriculum.

Frequently used web tools: YouTube (66%), Quizlet (63.8%) and Kahoot (63.8%). Their popularity is due to their interactivity and game elements that increase student motivation. However, Padlet (0%) and Miro (6.4%) tools are practically not used, which indicates low student awareness and the need for additional training for teachers on their implementation.

Regarding the role of the teacher, respondents noted that a modern teacher should be not only a source of knowledge, but also a mentor, innovator, and researcher. 68.1% of respondents believe that the most important role of a teacher is to develop students' autonomy in learning, while 63.8% emphasize their mastery of digital technologies. This indicates the need to develop methodological recommendations for improving teachers' digital competence and using modern technologies in teaching.

An interesting aspect of the study was the identification of the most suitable areas for the introduction of blended learning. Respondents gave priority to higher education institutions (68.1%), which is explained by the possibility of combining theoretical and practical lessons. Also, 57.4% of respondents noted the effectiveness of this method in individual lessons. However, blended learning was less popular in general education schools (36.2%) and private language centers (23.4%), which may be due to technical limitations or the traditional teaching model in these institutions.

Thus, the survey results indicate the high potential of blended learning in higher education institutions, its positive impact on foreign language learning, and the need to develop digital skills among teachers. To increase the effectiveness of this method, it is necessary to actively introduce new technologies, conduct training using less familiar tools, and adapt educational programs to the modern requirements of students.

Conclusion

The study confirmed that blended learning is a highly effective educational model that integrates traditional teaching with digital innovation. The results indicate that adaptive platforms, multimedia content, and gamified tools significantly enhance motivation, comprehension, and autonomy among students. The applied methodology, supported by validity and reliability testing (α = 0.87), ensured the credibility of findings.

It is recommended that higher education institutions:

– promote the integration of adaptive and gamified learning tools (Kahoot, Quizlet, Miro, Padlet) in language education;

– conduct teacher development programs focused on digital pedagogy;

– utilize AI-based platforms to personalize feedback and support learner independence;

– encourage inter-university collaboration for sharing best practices in blended learning.

Blended learning is thus not merely a combination of online and offline methods, but a dynamic pedagogical framework that fosters flexibility, collaboration, and innovation. Its successful implementation depends on the balance between technological and human components, ensuring that education remains both effective and student-centered.

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