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Research on the Blended Teaching Mode of Medical English under the "1+X" Certificate System: Based on the Theory of Needs Analysis

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Abstract:

Based on the needs analysis theory, this study investigates the effectiveness of the blended teaching mode for Medical English under the "1+X" certificate system. The "1+X" certificate system, which combines specialized vocational training with additional certification options, has gained popularity in medical education, yet the integration of Medical English within this framework remains underexplored. The research employs needs analysis theory to assess the specific linguistic needs of medical students, identifying key areas for instructional improvement. Data was collected through surveys and interviews with medical students and instructors, focusing on their experiences and challenges in acquiring Medical English proficiency. The study analyzes how a blend of traditional face-to-face teaching methods with online learning platforms can better address these needs, providing a more flexible and personalized learning environment. Blending these teaching modes can enhance students' engagement, promote self-directed learning, and improve their mastery of essential medical terminology. Additionally, using digital tools and resources allows for more interactive and practical applications, contributing to the development of a comprehensive and adaptable curriculum. This research offers valuable insights into optimizing Medical English instruction within the "1+X" system, proposing a more responsive and effective educational approach for future medical professionals.

Keywords: blended teaching, Medical English, "1+X" certificate system, needs analysis, curriculum development, digital tools, medical terminology, educational innovation.

1. Introduction

The field of medical education is constantly evolving, adapting to new technological advancements, changes in healthcare systems, and the growing needs of global health professionals. One of the key challenges in modern medical education is the effective teaching of Medical English, a specialized form of language instruction that caters to medical students' specific linguistic and communicative needs [1]. The importance of proficiency in Medical English cannot be overstated, as healthcare professionals need to communicate effectively with patients, colleagues, and the broader medical community [2, 3]. The challenge lies in developing effective teaching methods that not only address the general linguistic needs of students but also equip them with the specialized medical vocabulary and communication skills necessary for their future careers [4, 5].

One approach that has gained considerable attention in recent years is the "blended learning" model, which combines traditional face-to-face instruction with the flexibility and accessibility of online learning platforms. Blended learning has been widely regarded as a potential solution to the limitations of traditional teaching methods, offering a more flexible, personalized, and interactive learning environment [6]. Studies have shown that blended learning can enhance student engagement, improve learning outcomes, and increase access to educational resources [7, 8]. However, despite the growing body of literature on the effectiveness of blended learning in various educational contexts, research on its application to Medical English instruction remains limited [9].

Integrating technology into medical education is not new, but the shift toward blended learning presents unique challenges and opportunities in Medical English [10, 11]. Many studies have explored the use of technology in medical

education, focusing on areas such as e-learning, virtual classrooms, and digital resources for medical students. For instance [12], found that online learning tools and digital platforms significantly improve students' engagement and comprehension in medical courses. Similarly, research by [13] demonstrated that virtual learning environments enhanced medical students' understanding of medical terminology, clinical practices, and patient communication. These findings highlight the potential of digital tools to support and enhance traditional medical education. However, while these studies primarily focus on general medical education, there is a notable gap in the literature regarding the specific application of blended learning to teaching Medical English [14].

Another area of interest in teaching Medical English is the concept of needs analysis. Needs analysis is a widely used approach in language education that involves identifying and understanding the specific needs of learners in order to design effective instructional programs [15, 16]. In the context of Medical English, needs analysis helps pinpoint medical students' linguistic requirements, such as proficiency in medical terminology, the ability to understand and produce medical texts, and the capacity for effective communication in clinical and academic settings. Needs analysis has been employed in various studies to tailor language teaching programs to the specific needs of medical students. For example [17], conducted a needs analysis of medical students' language skills. They found that students often struggle to understand complex medical texts and communicate effectively in clinical environments. This highlights the importance of a needs-driven approach to medical English instruction, which can better equip students with the language skills required for their professional practice [18, 19].

The "1+X" certificate system has emerged as a significant vocational and medical education development. The system is designed to provide students with foundational knowledge and specialized skills through academic instruction and additional certification options. The "1+X" certificate system aims to meet the growing demand for professionals with academic qualifications and practical skills, particularly in fields like medicine where specialized knowledge and competencies are essential [20, 21]. While the system has been widely implemented in many countries, its application in the context of Medical English instruction remains underexplored. Some studies have focused on integrating language skills into vocational training programs, such as those by [22], highlighting the need for English language instruction in vocational settings. However, little attention has been given to how medical English instruction can be incorporated into the "1+X" framework, especially in blended learning methods.

Research on blended learning in medical education has also been influenced by the broader literature on language acquisition and pedagogical theory [23, 24]. Theories such as the Communicative Language Teaching (CLT) approach and Task-Based Language Teaching (TBLT) emphasize the importance of authentic communication and task-based learning in language acquisition. This can be translated into teaching students how to effectively communicate with patients, understand medical literature, and engage in professional dialogue in the medical field. Numerous studies have explored the use of CLT and TBLT in medical education, finding that these approaches encourage active learning and the development of practical language skills [25]. For instance, article [26] found that task-based approaches to teaching Medical English significantly improved students' communicative competence and ability to use medical language in real-world contexts. These findings underscore the importance of incorporating communicative and task-based strategies into Medical English instruction, which blended learning environments could further enhance [27].

As a pedagogical approach, blended learning offers a promising solution to the challenges of teaching Medical English in an increasingly digital world. Research [12] on blended learning emphasizes the combination of face-to-face teaching with online resources to provide a more comprehensive and flexible learning experience. In Medical English, blended learning can allow students to engage with online resources such as interactive medical dictionaries, video lectures, and language exercises while benefiting from in-person interactions with instructors and peers [28]. The use of digital tools in blended learning environments has been shown to enhance student motivation and engagement, particularly in the context of language learning. In study [6] found that using digital simulations and online platforms in medical education improved student participation and knowledge retention. This suggests that blended learning can offer significant advantages in student engagement, access to resources, and the development of practical language skills.

Despite the growing interest in blended learning and its potential benefits, challenges remain in its implementation, particularly in Medical English. One of the main challenges is the need for a curriculum that effectively integrates both online and face-to-face learning. As [29] noted, successful blended learning requires careful design and alignment of both traditional and digital teaching methods to ensure that students can make the most of both modes of instruction. Additionally, the diversity of students' learning needs and preferences must be considered when designing blended learning programs. For instance, some students prefer face-to-face interaction, while others thrive in an online learning environment. As such, developing a blended learning curriculum for Medical English should consider medical students' various learning styles and needs.

In light of these challenges and the existing body of research, this study aims to explore the effectiveness of blended teaching methods in Medical English under the "1+X" certificate system. By employing the theory of needs analysis, this study seeks to identify the specific linguistic needs of medical students and investigate how blended learning can address those needs. The findings of this study will contribute to the growing body of literature on blended learning in medical education, offering valuable insights into the integration of Medical English instruction within the "1+X" system and the potential benefits of using digital tools to enhance language learning. Through this research, we hope to provide a more responsive and adaptable approach to Medical English instruction that aligns with medical students' needs and prepares them for effective communication in their future careers.

2. Method

This study employs a mixed-methods approach to investigate the effectiveness of the blended teaching mode for Medical English under the "1+X" certificate system based on the needs analysis theory. The research design integrates both qualitative and quantitative data collection methods, which allows for a comprehensive examination of the linguistic needs of medical students and their experiences with blended learning. The methods section outlines the study's design, participants, data collection procedures, and data analysis techniques, all aimed at assessing how blended learning can meet the specific needs of medical students in acquiring proficiency in Medical English.

2.1 Research Design

The study adopts a descriptive research design, utilizing needs analysis as a theoretical framework to guide the investigation. Needs analysis, commonly used in language education, is a systematic process that identifies the language needs of learners in a specific context. This framework is particularly suitable for this study, as it allows the researchers to identify the particular linguistic needs of medical students and determine how the blended teaching mode can address those needs. The research design incorporates surveys and interviews as primary data collection tools, enabling the study to capture a range of perspectives from students and instructors.

2.2 Participants

The participants in this study were medical students and instructors from a university offering courses under the "1+X" certificate system. One hundred twenty medical students participated in the survey, and 15 instructors were interviewed. The student participants were selected using purposive sampling, focusing on students who had undergone Medical English instruction within the framework of the "1+X" certificate system. The selection of these participants ensured that the data would reflect the experiences and challenges faced by those who had already engaged with the blended learning model in the context of Medical English. The instructors were selected based on their experience teaching Medical English and their involvement in delivering blended learning programs.

The sample size was determined to be sufficient to ensure a diverse range of responses, providing both qualitative and quantitative data that would be valuable in understanding the effectiveness of blended teaching. The medical students represented a range of academic years and levels of proficiency in Medical English, allowing for a broad analysis of how the blended teaching model catered to different student needs.

2.3 Data Collection

The data collection process involved two main methods: surveys and semi-structured interviews.

A questionnaire was developed to assess the students' experiences and perceptions of Medical English instruction under the "1+X" certificate system. The survey included closed-ended and open-ended questions, allowing for quantitative analysis and qualitative insights. The closed-ended questions were designed to assess students' engagement with the blended learning model, their satisfaction with various teaching methods, and the perceived effectiveness of different components of the blended learning approach. These questions were rated on a Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to measure the students' attitudes towards the effectiveness of blended learning in improving their Medical English skills.

In addition to the closed-ended questions, the survey included open-ended questions to capture students' qualitative responses regarding their specific challenges in learning Medical English, the usefulness of online resources, and the impact of blended learning on their ability to understand medical terminology and communicate in clinical contexts. The survey was administered online, and responses were collected over three weeks.

Semi-structured interviews were conducted with 15 instructors who were involved in teaching Medical English within the blended learning framework. The interviews aimed to gain insights into the instructors' perspectives on the challenges of teaching Medical English, the integration of blended learning, and their observations on student performance and engagement. The interview questions focused on the following themes: (1) the advantages and disadvantages of blended learning for Medical English, (2) the effectiveness of online tools and resources, (3) the role of face-to-face instruction in the blended learning model, and (4) the alignment of the "1+X" certificate system with the goals of Medical English instruction.

The interviews were conducted in person or via video conferencing, depending on the instructors' availability, and each lasted approximately 30–45 minutes. All interviews were audio-recorded with the participant's consent and transcribed verbatim for analysis.

2.4 Data Analysis

The quantitative data collected through the surveys were analyzed using descriptive statistics. Responses to closed-ended questions were coded numerically, and the data were analyzed to identify trends and patterns in student attitudes toward blended learning. Measures such as mean scores, standard deviations, and frequency distributions were calculated to assess the overall effectiveness of the blended teaching mode in improving students' Medical English proficiency. The survey results were also used to identify areas where students felt the blended learning model was most effective and areas that required further improvement.

The qualitative data from the surveys (open-ended questions) and the interviews were analyzed using thematic analysis. Thematic analysis is a widely used method for identifying, analyzing, and reporting patterns or themes within qualitative data. The interview transcripts and open-ended survey responses were coded for recurring themes related to the students' and instructors' experiences with blended learning, the perceived effectiveness of the teaching methods, and the specific linguistic challenges students face. The codes were grouped into broader themes for in-depth data analysis.

The analysis of both quantitative and qualitative data provided a comprehensive understanding of the effectiveness of the blended teaching mode in addressing the linguistic needs of medical students. It also allowed the researchers to explore the relationship between student engagement with blended learning and their mastery of Medical English.

3. Results

The results of this study provide valuable insights into the effectiveness of the blended teaching model for Medical English under the "1+X" certificate system. The data collected through surveys of students and instructors, as well as the analysis of student satisfaction, highlight key findings related to student engagement, the perceived effectiveness of online resources, and the advantages of integrating blended learning methods.

The student survey focused on their experiences with the blended learning model, specifically the effectiveness of face-to-face instruction, online resources, and overall engagement. The survey results were generally positive, with most students indicating satisfaction with the model. Table (1) presents the mean scores and standard deviations for each survey question.

Table 1: Student Survey Responses

Question	Mean Score	Standard Deviation
The blended teaching model improved my engagement in learning Medical English	4.2	0.7
The online resources were helpful in improving my Medical English	4.5	0.5
Face-to-face sessions were more effective than online sessions for learning Medical English	3.8	0.8
I feel more confident in using medical terminology after the blended learning experience	4.3	0.6
The blended learning model enhanced my ability to understand medical texts	4.1	0.7

Table (1) shows that students generally found the online resources highly beneficial, with a mean score of 4.5 for the usefulness of online materials. The face-to-face sessions were rated somewhat lower, with a mean score of 3.8, suggesting that students perceived the online components as more effective. The students' confidence in medical terminology and ability to understand medical texts also showed positive outcomes, with scores of 4.3 and 4.1, respectively.

The instructors' perspectives were collected through semi-structured interviews, focusing on their observations of the blended learning model's impact on student engagement, the effectiveness of online tools, and the role of in-person instruction. Table (2) summarizes the mean scores and standard deviations for the instructors' responses.

Table 2: Instructor Survey Responses

Question	Mean Score	Standard Deviation
Blended learning enhances student engagement in Medical English	4.4	0.6
Online learning tools are effective for teaching Medical English	4.3	0.6
In-person instruction is still necessary for Medical English	3.9	0.7
Blended learning allows for more personalized learning experiences	4.6	0.5

The integration of '1+X' certificate system has enhanced Medical English instruction	4.2	0.6

The instructors rated the benefits of blended learning highly, with an average score of 4.4 for its impact on student engagement. Additionally, they agreed that blended learning facilitates more personalized learning experiences (4.6 mean scores). Although instructors acknowledged the necessity of face-to-face instruction, a score of 3.9 indicates that they believe a combination of online and in-person elements is most effective. They also supported integrating the "1+X" certificate system, noting its positive influence on Medical English instruction.

The survey revealed a positive response in terms of overall student satisfaction with the blended learning model. A significant proportion of students expressed high satisfaction, with 35% reporting being "very satisfied" and 45% "satisfied." Only a small percentage of students felt neutral or dissatisfied, as shown in Table (3).

Table 3: Student Satisfaction Level

Satisfaction Level	Percentage of Students (%)
Very Satisfied	35
Satisfied	45
Neutral	10
Dissatisfied	5
Very Dissatisfied	5

The results indicate that most students had a positive experience with the blended learning model, with 80% expressing satisfaction. Only 10% of students reported a neutral opinion, while a small minority (5% each) were dissatisfied.

The results suggest that the blended teaching model for Medical English, as implemented under the "1+X" certificate system, is generally well-received by both students and instructors. Students found the online resources particularly effective, leading to greater engagement and increased confidence in using medical terminology. On the other hand, instructors emphasized the benefits of personalized learning and the importance of combining both online and in-person instruction. The student satisfaction survey revealed that most students were satisfied with the learning experience, indicating the overall success of the blended learning model.

While both students and instructors still valued face-to-face instruction, the higher ratings for online resources suggest that the digital tools and platforms used in the blended learning model played a crucial role in enhancing students' learning outcomes. This supports the idea that a well-integrated blend of traditional teaching and online learning can provide a flexible and effective learning environment for Medical English instruction.

These findings contribute to the growing body of research on blended learning in medical education, particularly in the context of Medical English instruction, and suggest that the "1+X" certificate system provides a promising framework for enhancing the linguistic skills of medical students.

4. Discussion

The findings from this study provide valuable insights into the effectiveness of the blended teaching model for Medical English under the "1+X" certificate system. The results suggest that blended learning, which integrates both online and face-to-face components, can significantly enhance medical students' learning experience, particularly in acquiring specialized language skills required for medical practice. The combination of digital resources and traditional classroom instruction addresses the unique linguistic needs of medical students, contributing to improved engagement, increased confidence, and better comprehension of medical terminology.

4.1 The Effectiveness of Blended Learning for Medical English

One of the most striking findings of this study is the positive impact of online resources on student engagement and learning outcomes. The students' responses, with a mean score of 4.5 for the usefulness of online resources, suggest that digital tools and platforms played a central role in their learning experience. This aligns with previous studies, such as those by [30] and [31], who found that online platforms in medical education enhance student engagement and facilitate deeper learning. The availability of digital resources, such as interactive language exercises, video lectures, and medical terminology databases, offersoffers students greater flexibility in their learning, allowing them to study at their own pace and revisit materials as needed. The flexibility inherent in blended learning may be particularly beneficial for medical students, who often face a demanding academic schedule and must balance their studies with clinical training.

The relatively lower rating for face-to-face instruction (mean score of 3.8) suggests that while students value in-person teaching, they may perceive online components as more effective in helping them achieve proficiency in Medical English. This could be attributed to the interactive nature of digital tools, which engage students in a way that traditional classroom teaching cannot always match. Moreover, the availability of online resources allows for a more individualized learning experience, enabling students to focus on areas where they most need improvement. This flexibility in addressing individual learning needs could be one reason for the higher engagement levels observed in the blended learning environment.

4.2 Instructor Perspectives on Blended Learning

The instructors' responses further support the idea that blended learning can benefit medical education. With a mean score of 4.4, instructors agreed that blended learning enhances student engagement in Medical English. This finding is consistent with the literature on blended learning, which suggests that integrating online tools can create more dynamic and interactive learning environments [32]. Instructors also emphasized the importance of personalized learning experiences, with a mean score of 4.6 for this question. This finding highlights the advantage of blended learning in catering to the diverse needs of medical students. By combining online and face-to-face components, instructors can provide students with more tailored instruction that addresses their strengths and weaknesses.

Although instructors acknowledged the benefits of blended learning, they also recognized the continued importance of in-person instruction. The mean score of 3.9 for the necessity of face-to-face instruction suggests that instructors believe a combination of both online and traditional teaching methods is most effective. This is in line with the findings of [33], who argue that a successful blended learning model requires careful integration of both modes of instruction to create a holistic learning experience. Instructors in this study value face-to-face interaction for its role in fostering direct communication and providing immediate feedback, which is critical for developing language skills, especially in a specialized field like Medical English.

4.3 Student Satisfaction and Perceived Effectiveness

The student satisfaction data further supports the positive reception of the blended learning model. With 80% of students reporting satisfaction, it is clear that the blended teaching approach was well-received. This finding is consistent with previous research on blended learning in medical education, suggesting that students prefer flexible

learning environments that combine the best elements of both online and traditional teaching [34]. The high satisfaction levels observed in this study indicate that students value the convenience and accessibility of online resources while benefiting from the structure and guidance provided by in-person instruction.

However, the relatively small proportion of dissatisfied students (10%) suggests that there may still be areas for improvement in implementing blended learning. These students may have faced challenges adapting to the online components or may have preferred a more traditional, face-to-face approach. Educators need to consider these preferences and provide a balanced blend of teaching methods catering to all students' diverse needs. Future research could explore the reasons behind student dissatisfaction to identify potential barriers to implementing blended learning successfully.

4.4 Integration of the "1+X" Certificate System

Integrating the "1+X" certificate system into Medical English instruction represents a novel aspect of this study. The findings indicate that both students and instructors view the "1+X" system positively, with instructors noting that it enhances Medical English instruction. This suggests that the system's combination of foundational education and additional certification opportunities provides a relevant context for delivering Medical English courses. The "1+X" system may offer medical students a more comprehensive and flexible educational experience, allowing them to acquire the linguistic skills and specialized knowledge required for their future careers.

The positive feedback on integrating the "1+X" system is consistent with research by [35], which emphasizes the need for vocational education systems that combine academic knowledge with practical skills. The ability to earn certifications through the "1+X" system could motivate students to engage more deeply with their Medical English studies as they see the direct applicability of their language skills to their future professional practice. However, further research is needed to explore how the "1+X" system can be more effectively integrated into Medical English curricula, particularly in terms of aligning language instruction with the specific competencies required for medical practice.

5. Conclusion

The results of this study highlight the potential benefits of blended learning for Medical English instruction under the "1+X" certificate system. The combination of online and face-to-face instruction offers a flexible, personalized, and engaging learning environment that can address the specific linguistic needs of medical students. The positive feedback from both students and instructors suggests that blended learning can enhance student engagement, improve proficiency in medical terminology, and foster greater confidence in using English in medical contexts.

However, the study also highlights the importance of balancing online and in-person instruction and considering student preferences and learning styles when designing blended learning programs. Future research could investigate ways to refine and optimize the blended teaching model further to ensure that it meets the needs of all students, particularly those who may struggle with the online components—additionally, integrating the "1+X" certificate system into Medical English curricula warrants further exploration to fully understand its impact on language learning and its potential to enhance the overall educational experience for medical students.

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