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Research on the Influence of a New Media Mobile Terminal on Learner Participation and Autonomous Learning Ability

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ABSTRACT

Due to the rapid development of internet technology, the field of education is undergoing a revolutionary change. The purpose of this study is to explore how new media mobile terminals affect the learning style of college students, paying special attention to the changes in learners' participation and autonomous learning ability. Traditional learning methods have not sufficiently met the needs of contemporary college students, and the rise of new media mobile terminals has provided convenient for learning anytime and anywhere. Digitally competent college students have gradually become less dependent on traditional learning and turned to more independent learning methods. This study will analyze the specific influence of new media mobile terminals on learners' participation and autonomous learning abilities in order to provide useful insights for innovation in education and optimization of college students' learning methods.

KEYWORDS

New Media, Mobile Terminal, Autonomous Learning

INTRODUCTION

Due to the continuous development of new media technology, the mobile terminal has become an important way for people to obtain information, communicate, and interact. New media mobile terminals have been integrated into all aspects of people's daily life with its highly convenient characteristics. Learners are the future of society, and their participation in new media mobile terminals directly affects their learning.

At the same time, autonomous learning ability is one of the key factors affecting learning. In the current era of mobile internet, learners can arrange their learning time and content more independently by using new media mobile technology, and they can hence improve the flexibility and relevance of their learning.

Students can choose suitable learning resources according to their own learning rhythm and interest and decide the depth and breadth of their learning independently, thus promoting the improvement of their autonomous learning abilities. Therefore, this study will explore the influence

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of new media mobile terminals on learners' participation and autonomous learning abilities through empirical research, promote a deep understanding of learning methods, and provide a more scientific basis for education and teaching practices.

LITERATURE REVIEW

The use of new media mobile terminals has become increasingly prevalent in education, providing learners with new opportunities for autonomous learning and engagement. Huang et al. (2024) present a framework for delivering learning content to mobile learners, highlighting the factors that play a crucial role in this process. This framework emphasizes the importance of learner engagement and autonomous learning ability in the context of mobile learning (Ward et al., 2024). Several studies have explored the relationship between technology use, self-directed learning, and learner engagement (Rogti, 2024). For example, research has shown that technology and social media can enhance self-directed learning skills and student engagement (Wiboolyasarin & Jinowat, 2024). The proliferation of handheld portable devices connected to the internet has brought about new learning opportunities for learners, fostering mobile and autonomous learning (Zhu, 2024). Furthermore, the use of social media and mobile devices has been shown to facilitate communication and engagement among learners (Almalki, 2024). Educational social media platforms, such as Edmodo, have been utilized to enhance the learning process and familiarize students with new media mobile terminals (Lyu & Lai, 2024). In addition to learner engagement, the use of new media mobile terminals has been linked to the development of autonomous learning skills (Nussli et al., 2024). Research has examined the extent to which mobile devices increase learner autonomy, particularly in the context of English as a Foreign Language (EFL) high-school students (Mubinabonu & Sohib, 2024). Moreover, adult learners have reported relying on digital resources and technologies, such as the internet, social media, and mobile devices, when engaging in self-directed learning activities (Rossiter et al., 2024). Overall, the literature suggests that new media mobile terminals play a significant role in promoting learner engagement and autonomous learning ability (Zhang et al., 2024). These technologies have the potential to enhance the learning process and provide learners with new opportunities for self-directed learning (Medina et al., 2024).

RELATED MATERIALS AND METHODS

Overview of New Media

Having emerged due to the rapid development of mobile internet, new media mobile terminals refer to a media form in which the information dissemination path gradually turns to mobile devices and mobile applications. This covers mobile applications, social media, mobile video, mobile e-commerce, and other forms and has become an important part of today's new media era (Ayasrah et al., 2024).

Firstly, the new media mobile terminal has the convenient quality of obtaining information anytime and anywhere (Arrasyid et al., 2024). Through mobile devices such as smart phones and tablet computers, users can connect to the internet at any time and get the latest news, social dynamics, and entertainment content, which brings great convenience to people's lives (Hocine & Sehaba, 2024). Secondly, new media mobile terminals emphasize the personalization and customization of content. By collecting users' browsing records, hobbies, and other information, new media platforms can tailor content recommendations for users, improve user experience, and increase user retention (Fazil et al., 2024). Thirdly, new media mobile terminals pay attention to interaction and sociality (Mogavi et al., 2024). They are different from the one-way communication mode of traditional media because they pay more attention to interaction and communication between users such as praise, comments, and forwarding, so that users can participate in content production and communication more actively (Ogata et al., 2024).

In addition, new media mobile terminals also provide more possibilities for the innovation of business models (Pīgozne et al., 2024). The rise of mobile application stores has made mobile applications a new channel for enterprises to carry out marketing, promotion, and sales, and mobile advertising and mobile payment have increasingly become an important part of business development (Hakimi et al., 2024).

The main types of mobile new media include:

- mobile applications (apps), such as social media applications, news clients, gaming applications, and more;
- mobile websites optimized for mobile devices which can be accessed through a browser;
- mobile video platforms which provide mobile video content, such as Tiktok, Kwai, and more;
- mobile social media, which are mobile applications on social platforms such as WeChat, Weibo, and Facebook;
- mobile live streaming platform which provide mobile live streaming services, such as Bilibili live streaming, Twitch, and more; and
- mobile e-commerce platforms which use mobile devices for shopping and transactions, such as Taobao, JD.com, and more.

These types of mobile new media play an important role in today's society, providing users with rich and diverse information and entertainment content.

Mobile new media is widely used in various fields. Mobile new media can be used for online learning platforms, educational apps, or virtual classrooms, providing students with more convenient learning methods and personalized learning experiences (Hamad et al., 2024). Mobile new media can be used for health monitoring, medical information retrieval, or remote medical services to improve the efficiency and coverage of medical services (Abdel-Al Ibrahim & Basim, 2024). Mobile new media can be used for mobile payments, mobile marketing, or mobile shopping, promoting digital transformation and innovative development of business. Mobile new media is an important channel for news and information dissemination, including news apps or social media platforms, bringing real-time and diverse news reporting (Wu, 2024). Mobile new media, such as social apps and instant messaging tools, have promoted communication and interaction between people, changing people's social patterns and habits (Poon et al., 2024). Overall, the application of mobile new media in various fields has played a positive role in promoting information dissemination, improving work efficiency, and improving quality of life, becoming an indispensable tool and platform in modern society (Oliveros, 2024).

The rise of new media mobile has not only changed the form and communication mode of traditional media but also profoundly influenced people's lives, work, social interaction and other aspects. Alongside the continuous development and innovation of mobile technology, new media mobile terminals will continue to play an important role and become important platforms for information dissemination, social interaction, and business development.

Present Situation of Students' Autonomous Learning Abilities

Self-directed learning enables students to engage in learning outside the classroom, continuously accumulate knowledge and skills, and achieve lifelong learning goals. Autonomous learning abilities cultivate students' ability to think independently and solve problems, enabling them to have more confidence and find solutions when facing challenges and difficulties. Students with self-learning abilities are more likely to adapt to new learning environments and subject content, improving their ability to cope with changes. The ability of self-directed learning cultivates students' initiative and sense of responsibility, enabling them to participate in learning more actively while also treating their learning outcomes more responsibly. Autonomous learning abilities help cultivate students' innovative and creative thinking, enabling them to demonstrate greater creativity in the process of learning and

problem-solving. Therefore, the cultivation of students' self-learning abilities is of great significance for their future learning, work, and life and is an indispensable part of the education process.

There are some problems in the current landscape of students' autonomous learning abilities. Alongside the development of information technology and the renewal of educational ideas, students' autonomous learning abilities have become one of the hot spots in today's education field. However, there are still some current situations that need attention and improvement.

First of all, some students lack the clarity of learning objectives and self-management abilities. Some students are vague about their learning goals, lack long-term planning, and are easily disturbed by external factors, so they cannot arrange their learning tasks and time independently. Secondly, information overload and fragmented learning lead to unclear learning directions for students. Due to the explosion of information in today's society, students often get lost in the vast amount of information and can't choose suitable and relevant learning content, which leads to a certain degree of influence on their autonomous learning abilities.

At the same time, social networks and entertainment can jeopardize students' autonomous learning abilities. Students are addicted to social media, games, and other virtual worlds, ignoring the active acquisition of knowledge, and their autonomous learning abilities have been weakened to some extent. Besides, some students lack self-motivation and the abilities for independent inquiry. They depend on external constraints and supervision and lack spontaneous in-depth exploration of knowledge, which leads to a lack of autonomous learning abilities.

In view of the above problems, education departments and schools should strengthen the cultivation of students' autonomous learning abilities. Solutions include: introducing heuristic teaching methods into teaching to stimulate students' learning interest and autonomy; guiding students to make rational use of information technology tools and improve their abilities in information acquisition and screening; advocating diversified learning methods; and encouraging students to explore and practice independently after studying. Parents should play a good role in supervision, encouragement, and guidance. They can help students to establish good study habits, monitor learning time and content, encourage students to overcome difficulties, and provide necessary support and resources. In addition, parents can actively participate and interact with students when using mobile learning platforms, understanding their learning progress, promoting home school cooperation, and jointly creating an environment that supports student learning. Peers can exchange learning experiences, share learning resources, motivate and support each other, explore problems, and solve difficulties together. Through mutual learning, competition, and cooperation, peers can jointly improve their self-learning abilities, form a learning community, and construct a learning atmosphere.

The Influence of New Media Mobile Terminal on Autonomous Learning Abilities

New media mobile terminal have a far-reaching impact on autonomous learning abilities. Due to the rapid development of mobile internet and new media technology, the convenience for learners to obtain information, study, and communicate through mobile devices has been greatly improved. At the same time, mobile internet and new media technology has influenced their autonomous learning ability.

Firstly, the new media mobile terminal enriches the learning resources and expands the learning space. Learners can get rich learning resources through mobile devices anytime and anywhere, such as online courses, e-books, or learning apps, and they can choose and learn according to their own interests and needs, thus cultivating learners' abilities to obtain information independently. Secondly, new media mobile terminals strengthen the interaction and communication between learners. Through social media and online discussion platforms, learners can interact with other learners and teachers, share their learning experiences, and solve problems. This interaction is conducive to stimulating learners' motivation and autonomous learning abilities. Finally, mobile learning provides learning opportunities anytime, anywhere, which increases students' autonomy in terms of mastering learning time and location. Students can arrange their learning according to their own pace and preferences,

thereby cultivating the ability of self-directed learning. At the same time, new media mobile terminals provide a personalized learning experience. Through search engines, recommendation systems, and other technologies, learners can obtain personalized learning content according to their own learning needs and interests. This personalized learning experience is conducive to stimulating learners' interests and improving their initiative and autonomy in learning.

However, new media mobile terminals also have some negative effects. First of all, information overload may cause learners to be unable to screen and use information effectively, which will affect their learning. Secondly, learners' addiction to social networks and entertainment applications will consume a lot of learning time and weaken their abilities in autonomous learning. Frequent use of mobile devices for learning may have an impact on learners' long-term concentration. Mobile devices typically provide a rich variety of learning resources and applications, but they can also easily distract learners, making it difficult to maintain a continuous state of focus. Secondly, the use of mobile devices may have an impact on learners' ability to engage in deep reflection. Frequent use of mobile devices for learning may lead learners to lean towards fragmented learning methods, making it difficult for them to engage in in-depth and critical thinking.

Therefore, the influence of new media mobile terminals on autonomous learning abilities is twofold, both promoting and hindering. Educators and learners should actively face these influences, make rational use of new media mobile terminals, and cultivate learners' autonomous learning abilities. Educators should guide learners to use new media mobile terminals correctly and cultivate their abilities in actively obtaining information, independent thinking, and self-motivation; learners should improve their information screening ability, restrain bad habits, and arrange their study and entertainment time reasonably to receive the benefits of new media mobile terminals in promoting autonomous learning abilities.

Ensuring permanent access to learning materials and reasonable collection and use of personal data are crucial for protecting student privacy and autonomy during mobile learning. Mobile learning platforms need to take sufficient security measures to protect students' personal data, prevent data leakage, abuse, or unauthorized access. The platform should adopt encryption technology, access control, and data backup measures to ensure the confidentiality and integrity of data. The platform should follow the principle of data minimization, only collecting and using necessary personal data to ensure that data processing is in line with educational objectives. Excessive personal information should not be collected to avoid infringement of student privacy.

RESULTS AND ANALYSIS

Research Process

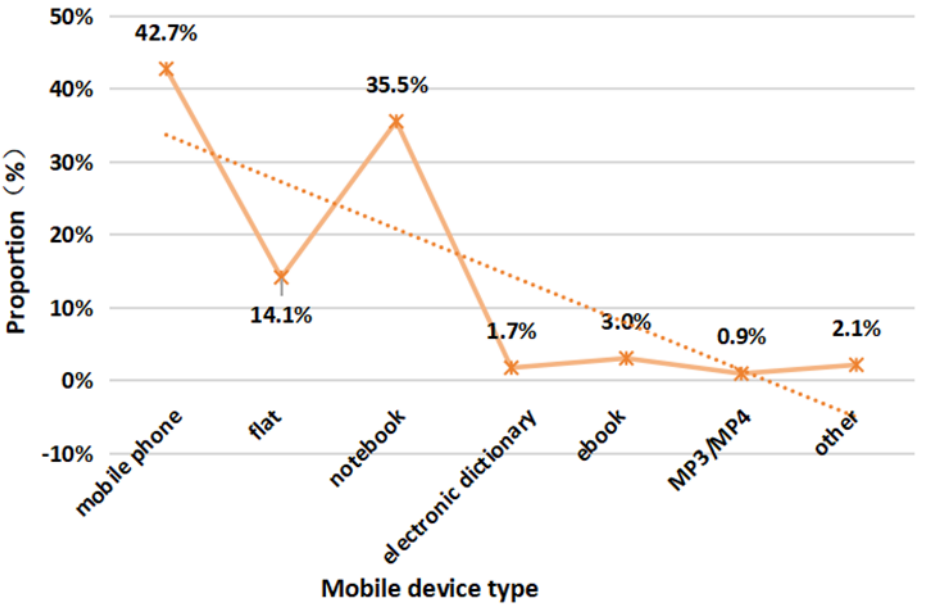
Research Method

This study mainly adopts the method of questionnaire and interview to collect and analyze data. Firstly, we compiled a questionnaire, distributed it through the test paper platform, and randomly sampled it with the help of our classmates. According to the total number of students in Changchun University, we used the calculation method of sampling to estimate the number of samples to be investigated. Next, we analyzed and sorted out the collected data and interview materials. Using this information, we discussed the situation of college students' mobile learning and autonomous learning abilities, the degree of correlation between mobile learning and autonomous learning abilities, and the predictive function of mobile learning on autonomous learning abilities.

Object of Investigation

This study is mainly aimed at the students of Changchun University. We randomly distributed the revised questionnaire with the help of the test paper star platform. Our goal is to understand the importance of mobile learning for college students and to provide a practical basis for enhancing

Figure 1. Proportion of mobile device types used by college students



their autonomous learning abilities. A total of 400 questionnaires were distributed in this study, and the recovery rate was 91.25%. After eliminating the invalid questionnaires, we received 312 valid questionnaires with an effective rate of 85.48%. The educational tools used by students include online learning platforms, educational games, and course aids. Students can access learning content such as textbooks and reference materials through e-book reading software or specific applications. Some academic databases and journals offer mobile applications through which students can access academic information and research results. Online education platforms such as Coursera and edX also offer mobile applications, allowing students to watch course videos and complete assignments through their mobile phones or tablets. My students usually download relevant learning applications from various app stores, such as the learning platform app provided by the school and mobile applications from well-known online education platforms. In addition to media content, the learning content also includes course outlines, exercise questions, interactive learning modules, and so on. The learning media content obtained by students through mobile devices usually combines multiple forms to enrich the learning experience and improve learning effectiveness.

Analysis of Experimental Results

The proportion of mobile device types used by college students is shown in Figure 1. There are multiple choices in the mobile devices used by middle school students in Figure 1. As can be seen from Figure 1, college students hold the most mobile learning terminal devices, namely mobile phones and notebook computers, which have advantages. It can be deduced that college students have a strong desire for mobile learning and like to use mobile devices for learning.

The proportion of mobile learning resource types used by college students is shown in Figure 2. As can be seen from Figure 2, the main content that college students browse on mobile devices is life encyclopedia knowledge, followed by learning information. Audio and video are college students' favorite ways to engage with curriculum resources.

The distribution of college students' mobile learning is shown in Table 1. As can be seen from Table 1, the ability of college students to use mobile devices for mobile learning is at a medium level.

Table 1. Distribution of mobile learning of college students

	Mobile learning form	Mobile learning behavior	Mobile learning resources	Mobile learning attitude
average/mean value	3.5865	3.3096	3.2260	3.4016
standard deviation	0.8960	0.6957	0.7354	0.5402

All four aspects are higher than the median value, which shows that the college students surveyed in this study have better mobile learning forms, mobile learning behaviors, mobile learning resources, and mobile learning attitudes.

The comparison of mobile learning differences between college students of different sexes is shown in Table 2. From Table 2, it can be seen that there are obvious differences in the gender distribution of mobile learning among college students. From the respective distribution of mobile learning forms, mobile learning behaviors, mobile learning resources and mobile learning attitudes, it can be seen that girls are higher than boys (all M girls > M boys), and there are obvious correlations (all $P < 0.05$), so it can be deduced that gender has the greatest influence on mobile learning behaviors.

There is a positive correlation between learners' participation in mobile terminals of new media and the effects of learning. Learners who frequently use new media mobile terminals demonstrate better academic performance, learning attitude, and learning interest. Therefore, the use of new media mobile terminals can improve learners' autonomous learning abilities. Through new media mobile terminals, learners can obtain learning resources anytime and anywhere, conduct self-evaluation, and adjust learning progress, thus improving learning efficiency.

New media mobile terminals play an important role in promoting learners' participation and autonomous learning ability. Therefore, educators should prioritize the application of new media mobile terminals in teaching and provide more opportunities for students to use new media mobile terminals to improve their learning. At the same time, educators should also pay attention to the

Figure 2. The proportion of mobile learning resource types used by college students

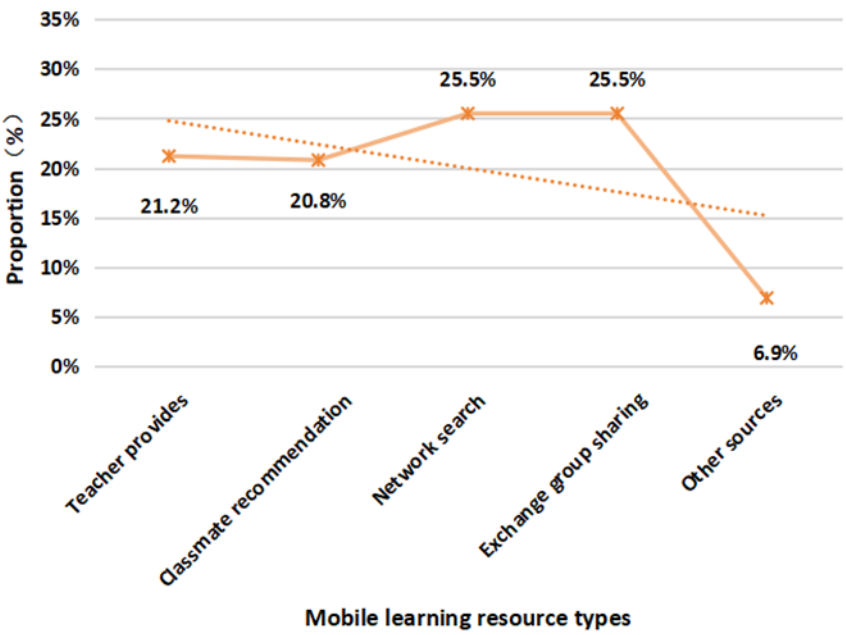


Table 2. A Comparative study on the differences of mobile learning among college students of different sexes

	gender	number	average value	standard deviation	T value
Mobile learning form	male	168	3.3661	0.99621	-4.862
	female	144	3.8438	0.68057	
Mobile learning behavior	male	168	3.2411	0.74644	-1.888
	female	144	3.3896	0.62441	
Mobile learning resources	male	168	3.2589	0.72172	-5.22
	female	144	3.1875	0.75175	
Mobile learning attitude	male	168	2.9256	0.56857	-2.712
	female	144	3.0903	0.49232	
Mobile Learning	male	168	3.1979	0.58692	-3.04
	female	144	3.3778	0.43119	

cultivation of students' autonomous learning abilities and guide students to make full use of new media mobile terminals to improve these abilities.

Analysis of Practical Applications

Although new media mobile terminals play an important role in learning, we must also be aware of the limitations of the viewpoints presented in this article. Firstly, the level of learner participation in new media mobile terminals is not the only factor that affects learning outcomes. Individual differences, learning motivation, and other factors also have important impacts. Secondly, although new media mobile technology can improve the flexibility and targeting of learning, excessive reliance on mobile devices may interfere with learning outcomes and even affect the expansion of learning depth and breadth. Finally, in the current research design, the sample is entirely composed of students from Changchun University. Although this provides a centralized view of the impact of new media mobile terminals in this specific educational environment, it limits the applicability of research findings in a broader context. It would be beneficial to include a more heterogeneous sample population to improve the robustness and relevance of the study. This can be achieved by incorporating participants from a range of educational institutions, including different types of universities, colleges, and vocational schools, and even expanding the scope of research to include adult learners in the continuing education environment. In addition, expanding the geographical scope from Changchun to other regions, including urban and rural areas, can provide a deeper understanding of how location and related cultural factors affect the autonomous learning of new media mobile terminals.

While exploring mobile learning as a tool to enhance education, we must also recognize the potential addiction risks and their negative impacts on student education and mental health. The convenience and flexibility of mobile learning may make it easier for students to become addicted to mobile phones or tablets, leading to decreased learning efficiency, weakened social skills, and even anxiety. Therefore, we need to balance the use of mobile learning with measures to reduce potential addiction risks, such as establishing reasonable learning time planning, encouraging diverse learning methods, strengthening home school communication, and guiding students to use mobile learning tools correctly. Only by finding appropriate methods between balanced utilization and risk reduction can mobile learning truly realize its value in strengthening education while minimizing negative impacts on students.

This article explores the practical significance of education and teaching practices, online learning platforms, personalized learning promotion, and educational policy formulation:

1. Education and teaching practice: Schools and educational institutions can design teaching content and methods that better meet the needs of students based on research results and the characteristics of new media mobile terminals, improving learner engagement and self-learning ability.
2. Optimization of online learning platforms: Online education platforms can utilize the research findings of this article to optimize mobile application interfaces and functions, provide more personalized and flexible learning experiences, and promote learners to better utilize mobile terminals for learning.
3. Personalized learning promotion: Based on learners choosing learning resources independently, a personalized learning recommendation system can be developed to help students find suitable learning content more quickly and accurately and improve learning effectiveness.
4. Education policy formulation: Research results can provide scientific basis for education management departments, guide the formulation and adjustment of relevant policies, and promote the application of educational informatization and mobile learning in the field of education.

This paper has currently confirmed a snapshot of the impact of new media mobile terminals on self-directed learning. However, to truly understand the depth of this impact, it is necessary to expand the research scope and observe and track the learning patterns of participants over a longer period of time. In the future, this long-term perspective can be considered to promote discussions on the long-term impact of mobile learning on self-directed learning. In addition, students from different cultural backgrounds may have different perceptions and attitudes towards mobile learning technology. Cultural factors such as individualism and collectivism, power distance, and uncertainty avoidance may affect students' acceptance and willingness to use mobile learning. In the future, we will consider the cognition and attitudes of students from different cultural backgrounds to understand their views and expectations on mobile learning better and provide guidance for customized educational programs. Finally, due to the continuous advancement of technology, the application of augmented reality (AR) and virtual reality (VR) technologies in mobile learning will become an important research field. Future research can focus on how these technologies can change students' learning experiences and self-directed learning abilities, especially their role in immersive learning environments. Through in-depth research on the application of AR and VR in education, important insights can be provided for the development of more effective mobile learning tools.

CONCLUSION

At present, mobile terminals are integrated into every aspect of our daily lives. In terms of learning effectiveness, the question of how to utilize mobile terminals efficiently has become a hot topic in the field of education. In this study, we found that new media mobile terminals have a positive impact on learner engagement and self-learning ability. By frequently using new media mobile terminals, learners' self-learning ability has been improved. This article can help educators and decision-makers more accurately formulate teaching strategies and policies to integrate these technologies into educational practice better. To utilize new media mobile terminals better to improve learning efficiency and quality, educators and learners should actively utilize the learning resources and platforms provided by new media mobile terminals to improve their self-learning abilities. However, in the process of using new media mobile terminals for learning, we need to remain rational, avoid addiction, and ensure healthy and effective utilization. In the future, we will consider further in-depth research on the relationship between new media mobile terminals and learners, promoting their positive role, providing learners with better personalized learning experiences, and promoting comprehensive improvement of their learning abilities. Future research can focus on exploring the potential changes in learning experiences and knowledge transfer through AR and VR technologies. This research helps to provide guidance on the practical application of these new technologies in mobile learning, providing a roadmap for educators and decision-makers to integrate these technologies into teaching practice.

DATA AVAILABILITY

The figures and tables used to support the findings of this study are included in the article.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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