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Strategies for Cultivating Postgraduates' English Autonomous Learning Ability Under the Background of Big Data

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ABSTRACT

The wide application of big data not only provides convenience for the teaching between teachers and students, but also plays a great role in the education and training of college students. However, how to cultivate students' ability to learn English independently in the current era remains to be studied. Under the background of big data, it is very important for today's education to make effective use of this technological advantage to explore scientific and reasonable strategies, stimulate college students' attention to English autonomous learning, and explore the learning process. Investigating the value of specific big data technology is also an important consideration in this study. At the same time, graduate students who are not English majors usually have fewer English courses, and students' English level is also very different. Therefore, we should also pay attention to improving students' oral English ability and pay special attention to the cultivation of students' self-discipline and autonomous learning ability.

KEYWORDS

Autonomous Learning, Big Data, English Major, Graduate Students, Training Strategy

With the development of global economic integration, the importance of English is becoming increasingly prominent, and the cultivation of independent English learning ability for graduate students has become very important (Buhl et al., 2013). However, the traditional English learning model can no longer meet the needs of social development. Fortunately, the rise of big data technology provides a good teaching and learning platform for teachers and students and has a huge promoting effect on cultivating graduate students' ability to learn English independently. In this era of big data, we need to think about how to effectively utilize this advantage, adopt scientific and reasonable strategies to stimulate graduate students' interest in self-directed English learning, and encourage them to actively explore in the learning process, thereby improving their self-directed learning ability

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and truly realizing the value of big data technology (Cai & Xiao, 2022). This article explores the impact and countermeasures of the big data era on English learning and analyzes its effects on English learning through case studies. The results proved to be helpful. This study can help students better plan and manage their learning process, while improving learning effectiveness and self-directed learning ability. Meanwhile, this research can help educators and students better utilize big data technology to promote innovation and development in English teaching.

LITERATURE REVIEW

With the continuous progress of technology and the deepening of education system reform, society's demand for graduate students' self-learning ability in English is increasing (Fan et al., 2014). At present, graduate students in universities are facing increasingly extensive and detailed English knowledge, but traditional school education still has certain limitations, and most students are unable to obtain extracurricular English knowledge (George et al., 2014). The concept of self-discipline or learner self-discipline belongs to the category of educational philosophy. Autonomous English learning refers to learners taking responsibility for their own learning during the learning process (Gill, 2007). Autonomous learning is essentially the result of complementary abilities and attitudes (Harford, 2014). Obviously, English self-directed learning ability is a multidimensional concept that includes at least three factors: ability, psychology, and behavior. Students with autonomous learning abilities have the ability to develop learning plans, execute them, evaluate and reflect on learning outcomes, and take on learning responsibilities (Hoff, 2003). Autonomous learning is achieved through the awareness of students, which is crucial for self-improvement of learning habits. In addition, due to the inherent individual differences among students, some of the factors that lead to these individual differences are immutable, while others can be compensated for through one's own diligence and hard work (Krause, 1964). In these situations, self-discipline in learning is also very important for students. Therefore, cultivating the autonomous learning ability of graduate students can be said to be one of the most effective methods to compensate for individual differences (Li et al., 2010). At the same time, there are some problems in current graduate English education that restrict the development of graduate English proficiency (Manathunga & Goozée, 2007).

In the context of big data, it is very convenient for graduate students to learn English independently (McAfee et al., 2012). Graduate students can learn English through the internet and leave traces and digital fragments in the process (McNitt-Gray et al., 2007). By tracking and analyzing these digital fragments, teachers can implement personalized teaching for students, subverting traditional vocabulary and grammar teaching methods (Pavlović et al., 2009). By using these digital fragments, students can have a more comprehensive and systematic understanding of their learning situation, while discovering and mastering specific learning patterns (Rampino, 2011). Instead of relying on limited judgment from teachers as before, they often find more suitable learning methods, adjust and improve learning strategies based on actual situations, and improve their English proficiency. In addition, under the background of big data, the content of English teaching resources is very rich (Reich, 1994). Graduate students can flexibly access teaching resources such as online teaching courses, lectures from renowned teachers, and self-study CDs (Riskin et al., 2006). By watching teaching videos, students can achieve online real-time learning and practice English reading and writing skills (Salite, 2015). Teachers can also utilize high-quality online teaching resources to edit courseware and enrich its content. In short, both students and teachers have benefited greatly from it (Soto et al., 2009).

RELATED MATERIALS AND METHODS

The Importance of Developing Autonomous Learning Ability

Autonomous learning ability is one of the core qualities of college students (Spieth et al., 2014). With the continuous development of social technology, people's ways of life, work, and learning are undergoing change (Tost et al., 2015). People without the ability to learn independently will be abandoned by society (Towle & Cottrell, 1996). Therefore, graduate students should develop good study habits, have a positive exploratory heart, not give up easily, and maintain long-term independent learning. Postgraduates should also learn to adjust their learning strategies in the learning process to improve learning efficiency. In addition, the uneven distribution of teaching resources is one of the important reasons for self-directed learning ability. High-quality teaching resources are often more concentrated in higher education institutions and economically developed cities. The teaching equipment and resources in economically underdeveloped areas are often relatively backward, and the teaching staff is also relatively weak, which leads to relatively low learning efficiency for students. The autonomous learning method and process are shown in Figure 1.

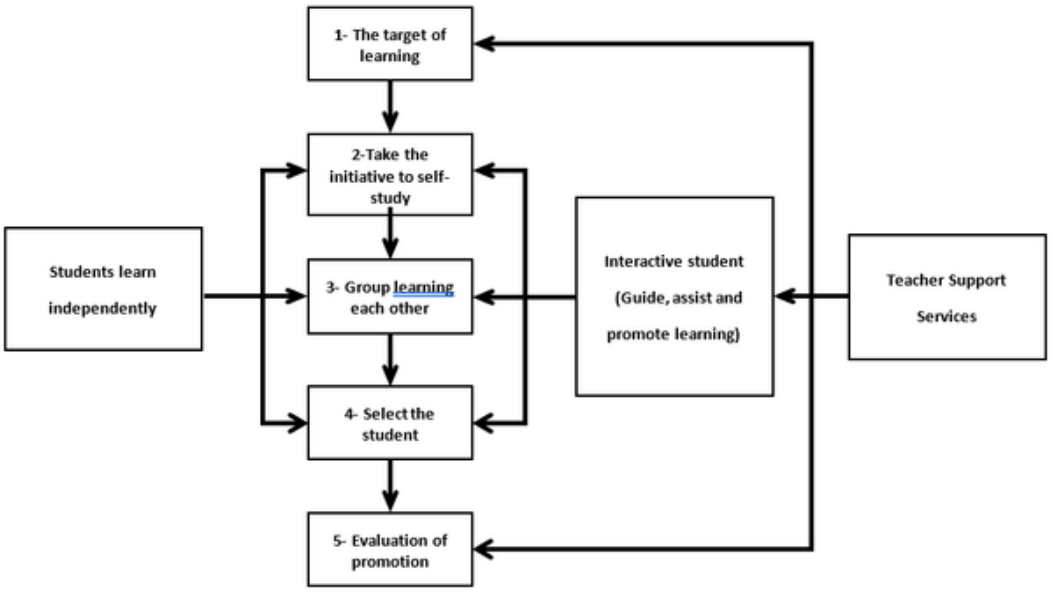
The New Changes Brought by Big Data to English Learning

The rise of the big data era has brought about significant changes in English education (Wisker et al., 2003). The role of teachers has shifted from leading to guiding, and students have become true learning subjects with greater personal development space (Wu et al., 2013). In the era of big data, learning platforms can obtain student learning data, which can not only analyze students' learning styles, learning motivations, cognitive tendencies, and learning strategies, but also analyze information such as teaching habits, teaching concepts, teaching behaviors, and interaction tendencies between teachers and students.

Changes in Teacher Roles and Tasks

In the era of big data, teaching resources have been shared, and students can choose suitable learning resources based on their learning needs on the learning platform. Therefore, for teachers, teaching

Figure 1. Self-regulated learning methods and processes



content is no longer unique. Students can freely choose learning resources and independently manage their learning time, which can fully tap into their active and self-directed learning abilities. However, students may encounter difficulties or confusion in choosing learning resources and the learning process, and teachers need to provide timely guidance and assistance. Teachers not only need to master various multimedia technologies and information technology to create micro courses, but also need to be familiar with the use of teaching platforms. Facing the rich and diverse online course videos on the platform, teachers should not only be familiar with these teaching resources, but also provide practical English learning skills for students. In the era of big data, through information technology, the course information and teacher evaluations of many universities are made public to students. Students can decide whether to choose the course based on the evaluation of previous students on the course and the teacher. Therefore, in the era of big data, students are no longer passively accepting English courses and teachers, but have the right to make independent choices and evaluations. This has brought new challenges to the teaching of English teachers, who need to change their roles in a timely manner and actively respond to new situations and challenges.

Changes in Student Roles

Due to the complexity of student sources, students have different English foundations, which puts higher demands on English teaching. In traditional English teaching, it is difficult to simultaneously consider the learning situations and needs of different students, which is not conducive to cultivating students' interest in English learning and autonomous learning ability. However, in the era of big data, the emergence of online learning platforms has made students' English learning equal, open, and autonomous. Regardless of the source of students, they can choose English teaching resources that are suitable for themselves on online learning platforms based on their learning situation and needs. Meanwhile, in the process of learning English, if students encounter difficulties or doubts, they can promptly seek advice from teachers or share, discuss, and communicate with other students. This greatly increases the opportunities for students to engage in independent English learning, expands the avenues for English learning, and helps cultivate their ability to learn English independently.

Changes in Student Learning Methods

Based on constructivist theory, English learning refers to students participating in various English learning environments and reflecting on their existing English knowledge, ultimately reconstructing a new English knowledge system. Traditional English classroom teaching is teacher led, with relatively monotonous teaching content and materials. The ways for students to access teaching resources are also relatively limited, and learning interaction is limited to pre-class discussions, answering questions, role-playing, and task presentation. Under the traditional teaching mode, the cultivation of students' interest in learning English and their ability to learn independently is limited. However, in the era of big data, learning resources on online learning platforms come in various forms, including not only traditional learning materials such as documents, images, and audio, but also emerging learning materials such as animations and videos that integrate multimedia informatization. With the promotion of new teaching models such as microlessons, massive open online courses (MOOCs), and flipped classrooms, the ways for students to learn independently have become more diverse and, most important, the time and space for learning are no longer limited. The interactive learning between students and teachers has also been strengthened. Teachers can track students' homework completion status online and provide timely evaluations and feedback. On online learning platforms, students can also analyze and discuss a certain knowledge point among themselves. In short, the advent of the big data era has promoted changes in the way vocational college students learn English, while also promoting the cultivation of students' ability to learn English independently.

Strategies to Enhance Self-Directed Learning Abilities

Utilizing Learning Platforms

The network learning community is also known as an online learning community (Yang & Wu, 2022). In online learning platforms, learners and facilitators work together to complete learning tasks through communication and discussion (Yaqoob et al., 2016). The main factors involved in this process include learners (students), facilitators (teachers), online media, and information flow. Teachers use online learning platforms for English teaching, which not only truly realizes a student-centered teaching model, but also constructs an interactive language learning environment for students' English learning. At the same time, in online learning platforms, teachers can monitor the learning process of students and promptly solve their learning difficulties. Teachers can also evaluate students' learning performance and develop personalized learning plans, thereby mobilizing their enthusiasm and initiative in English learning and cultivating their ability for independent English learning. The online learning platform provides a rich and diverse range of learning resources, such as textbooks, courseware, videos, audio, and exercise questions. By utilizing these resources, students can choose suitable content for their learning needs and broaden their knowledge. Moreover, students can arrange their own independent learning according to their own time. By planning study time reasonably, improving learning efficiency, cultivating good study habits, and communicating and sharing learning experiences with others, students can expand their thinking and knowledge.

Strengthening Guidance and Supervision of Student Learning Activities

In the era of big data in college English online self-directed learning, students are the main body of learning, but this does not mean that teachers can completely let students go in the learning process. On the contrary, the self-directed learning model places higher demands on teachers. Based on the feedback from the interviews, it can be seen that in actual teaching activities, teachers tend to impose strong teaching behaviors rather than guiding and supervising students' self-directed learning activities. However, in the online environment, teachers need to put in more effort than in traditional classrooms. Teachers should strengthen pre-class guidance, use online platforms such as U-Campus, WeLearn, and Good Strategy Reading to conduct discussions, guide students to search for background knowledge online, and prepare for self-directed learning. In addition, teachers also need to provide assistance based on individual differences among different students. Through the data provided by online learning platforms, teachers can monitor students' learning progress, understand their learning outcomes, and provide guidance and advice. Teachers should be good at using forums such as QQ groups, WeChat groups, and emails to interact with students, understand their learning status, learning strategies, and emotions, and provide necessary supervision and guidance to improve the efficiency of students' self-directed learning. It should be emphasized that teacher supervision should be moderate. Providing too much help may stifle students' learning enthusiasm, while excessive self-discipline can affect learning efficiency.

Cultivating Interest in Self-Directed Learning and Master Self-Directed Learning Strategies

After entering university campuses, college students need to change their learning concepts, no longer rely on teachers, but seek their subjective learning motivation and set self-learning goals. They can utilize rich online resources, listen to English songs, watch classic movies and TV shows, learn about Western culture, and actively cultivate interest in learning English. Teachers should guide students to collect information related to teaching content from the internet, use multimedia technology in the classroom to increase the fun of learning, and guide students to actively participate in classroom activities. Teachers should also guide students to master strategies for autonomous listening and reading, teach them methods for predicting listening materials, and pay attention to inflection words, demonstrative words, and keywords; good teachers will cultivate students' skills in intensive reading, skimming, and speed reading. Teachers should develop personalized teaching plans based on the

specific situation and needs of students, guide them in inquiry-based learning, and cultivate their interest in learning and independent thinking ability. Teachers should also pay attention to classroom interaction, encourage students to ask questions and express opinions, conduct group discussions and cooperative learning, and promote communication and interaction among students. Mastering self-directed learning strategies can effectively overcome the psychological barriers that students encounter during the process of self-directed learning, alleviate psychological anxiety, enhance their confidence, reduce intellectual blindness, and gradually increase their interest in self-directed learning.

Providing Personalized Course Content and Self-Learning Feedback

Universities should independently choose the learning content of college English courses based on their training objectives and student needs and fully utilize online resource platforms to provide diverse course formats. Students can choose and learn independently, by providing personalized learning methods and content for college English. In the era of big data, curriculum design should fully consider the personalized needs of students in the era of network and multimedia and provide students with learning content of different difficulty levels to meet their self-learning needs. After conducting online English self-directed learning, it is crucial to receive diagnostic feedback on practice and self-assessment in order to improve the English proficiency. Diagnostic feedback can help students understand their mistakes, rather than just providing correct answers or scores, achieving personalized feedback. This form of feedback can be achieved through big data analysis technology, providing timely and detailed analysis of each student's mistakes and showcasing the situation of other learners in online self-directed learning, thereby stimulating students' interest and enthusiasm for self-directed learning and persevering in learning.

Case-Related Information

Experimental Subjects

The research subjects of this article are four graduate classes of the same grade at Nanjing University of Traditional Chinese Medicine, with a total of 101 students. The teaching classes are numbered as Class A (sample size of 50) and Class B (sample size of 51), respectively. The experimental period is one academic year for graduate students.

Research Tools

The research content selected for this article's experiment includes the College English Test Band 6 (CET-6) test paper, the research tools used are the five component scale method and SPSS (Statistical Package for Social Sciences) statistical analysis software, and a combination of qualitative and quantitative research is used for study and analysis.

Research Steps and Methods

The research process of this paper includes five stages: pre-test, pre-experiment questionnaire survey, teaching experiment, post-test, and questionnaire interview analysis. Before the experiment began, researchers conducted a national CET-6 on graduate students from four classes, without informing them of any information or answers. All test papers and data were collected in class to test whether there was a significant difference in English proficiency among the students from the four classes. Then, the researchers conducted a learning strategy questionnaire survey using a five-component scale, aiming to discover whether there were significant differences in the understanding and use of language learning strategies among students in the four classes. Researchers used SPSS software to statistically analyze the pre-test results and found no significant differences in grades and language learning strategies among the four classes. Therefore, this study will set two random classes as control classes, abbreviated as Class A, and the remaining two classes as experimental classes, abbreviated as Class B, taught by the same teachers. The control class (Class A) continues to use the original

teaching method, while the experimental class (Class B) incorporates teachers' full process strategy training. Based on students' online self-directed learning, comprehensive method guidance, learning strategy training, and unit learning process demonstration are provided to them, including training on metacognitive, cognitive, and social/emotional strategies, as well as explanations of related skills. After the one-year teaching experiment, the researchers conducted another test on four classes using the CET-6 to compare and analyze their differences in English proficiency. Both tests were conducted without informing the subjects of any relevant information to ensure the reliability and effectiveness of the tests. After the post-test, the teacher distributed a survey questionnaire to the subjects, collected qualitative data such as learning strategies they used in the process of self-directed learning, and conducted in-depth interviews with students to explore the role and current situation of teacher strategy guidance. Through quantitative and qualitative analysis of test scores and learning strategy survey questionnaires, the final conclusion is drawn.

RESULTS AND ANALYSIS

Analysis of Experimental Results

Pre-Test Data Analysis and Survey Scale Analysis Results

The test results of the pre-test scores of control Class A and experimental Class B are shown in Figure 2.

In statistics, significant differences are only indicated when the probability (P) value is ≤ 0.05. As shown in Figure 2, the independent sample two tailed test value Sig. (2-tailed) value is 0.843, which is greater than 0.05, indicating that there is no significant difference in the initial grades between the two classes, thus demonstrating comparability in the experiment. Next, the scale data of students' learning strategies is analyzed. The researchers conducted T-tests and ANOVA F-tests on the data from two classes, and the seven test values were 0.095, 0.514, 0.477, 0.081, 0.491, 0.692, and 0.551, all greater than 0.05. This indicates that there is no significant difference in cognitive strategies, emotional strategies, and metacognitive strategies (such as goals, plans, monitoring, evaluation, and reflection) between the students in the two classes.

Post-Test Data Analysis Results

The test results of the post-test scores of control Class A and experimental Class B (as shown in Figure 3) show the Sig after the two tailed test The value of Sig. (2-tailed) is 0.022, which is less than 0.05, indicating a significant difference in grades between the two classes. This indicates that after one academic year of study, the English proficiency of students in Class A and Class B has undergone significant changes.

The researchers conducted T-tests and ANOVA F-tests on the significance of the difference in mean between the two samples, and the results showed that the two tailed detection coefficients for planning, monitoring, and reflection in cognitive and metacognitive strategies were 0.003, 0.020, 0.001, and 0.004, respectively, which were less than 0.05. This indicates that after one year of learning, there is a significant difference in these four learning strategies between the four classes. However, the

Figure 2. Test results of pre-test scores

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
before	Equal variances assumed	.199	.657	-.198	99	.843	-.36275	1.82999	-3.99385	3.26836
	Equal variances not assumed			-.198	98.767	.843	-.36275	1.82874	-3.99147	3.26598

Figure 3. Verification results of post-test scores

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
after	Equal variances assumed	.601	.440	2.326	99	.022	4.08784	1.75752	.60055	7.57514
	Equal variances not assumed			2.329	97.522	.022	4.08784	1.75501	.60488	7.57081

detection coefficients for emotional strategy and evaluation strategy are 0.071 and 0.069, respectively, indicating that there is no significant difference between the four classes in these two strategies.

Vertical Comparative Analysis of Pre-Test and Post-Test Score Data

The comparative analysis results of the pre-test and post-test scores of Class A in the control class are shown in Figure 4.

Figure 4 shows the paired sample test for Sig. (2-tailed) value is 0.241, which is greater than 0.05, indicating that there is no significant difference in the performance of control Class A in the pre-test and post-test.

The comparative analysis results of the pre-test and post-test scores of Class B in the experimental class are shown in Figure 5.

Figure 5 shows that the paired sample test value Sig. (2-tailed) is 0.001, which is greater than. 05. This indicates that after one academic year of study, there is a significant difference in the performance of experimental Class B in the pre-test and post-test.

After nearly a year of teaching experiments, the study found that Class A in the control group achieved a certain level of improvement in English proficiency during the one-year learning process, but the progress was not significant. The main obstacle factors are students' insufficient understanding and application of learning strategies. In contrast, after a year of teacher strategy guidance, the experimental Class B conducted self-directed learning, significantly improving their English proficiency, and their grades were significantly higher than those of Class A. This indicates that teacher strategy training is crucial for improving the English grades of college students. The study also found that there was no significant difference in learning strategy cognition among students in the four classes before the experiment began. However, after the experiment, significant differences

Figure 4. Comparison and analysis results of grade data for Class A

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	A_before - A_after	-2.02000	12.02292	1.70030	-5.43688	1.39688	-1.188	49	.241

Figure 5. Comparison and analysis results of grade data for Class B

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	B_before - B_after	-6.47059	13.39754	1.87603	-10.23871	-2.70247	-3.449	50	.001

were observed in the planning, monitoring, and reflection of cognitive and metacognitive strategies among the four classes. This indicates that teacher strategy training effectively improves students' metacognitive and cognitive strategy levels, thereby enhancing their English autonomous learning ability. However, there was no significant difference in emotional strategies among the four classes, and more in-depth research is needed to explore the reasons behind it. It should be pointed out that this study has some shortcomings and limitations, such as small sample size, short experimental time period, and incomplete network learning system. Nevertheless, this experiment strongly demonstrates the important role of teacher strategy training in improving the autonomous learning ability of college students in English. The research results indicate that the teaching model that combines teacher strategy training with student self-directed learning is feasible and effective and thus is worth adopting and promoting in future teaching reform practices.

The Dilemma and Countermeasures of Self-Directed Learning

Autonomous learning is a learning approach that emphasizes student autonomy and initiative. It gives students more autonomy and learning freedom, allowing them to choose learning content, develop learning plans, and evaluate learning outcomes based on their interests and needs. However, in the actual educational environment, students also face some difficulties and challenges in self-directed learning.

Lack of interest in learning and unclear learning objectives: Autonomous learning is a learning method that requires a high degree of self-awareness and self-discipline, but due to the lack of sufficient learning interest and unclear learning goals, many students are unable to truly engage in autonomous learning. In this situation, it is difficult to ensure that students can continue to engage in self-directed learning, and it is also difficult to cultivate their ability for self-directed learning. In addition, the lack of clear learning objectives can lead to uncertainty in learning plans and content, further exacerbating students' aversion and resistance to self-directed learning. Therefore, in order to enhance students' ability for self-directed learning, educators should enhance their enthusiasm and motivation for self-directed learning by stimulating their interest in learning and clarifying learning goals, thereby promoting their better engagement in self-directed learning.

Lack of effective self-directed learning strategies and guidance: In traditional indoctrination education, students generally rely too much on teachers, lacking self-learning ability and effective self-learning strategies. Most students only adopt a single and blind learning method. Many students are not accustomed to self-study before class and searching for relevant background knowledge online. They are not accustomed to using communication tools to communicate in English with people and rarely use online platforms for self-directed learning. Many universities are reducing their college English classes in hopes that students can independently use online platforms to master English language skills, but they have overlooked systematic training on students' self-learning ability in the face of big data environments. A large proportion of students are willing to choose learning resources online, but they do not know where to start, blindly and arbitrarily choosing learning resources, resulting in unsatisfactory learning outcomes. Due to the lack of systematic online self-directed learning training and guidance, despite the introduction of online platforms such as U-Campus, WeLearn, and Haoce Reading, many students still cannot solve learning difficulties such as slow improvement in listening and speaking abilities and limited vocabulary. In addition, their weak willpower gradually leads to a loss of interest in online self-directed learning, and they become addicted to online chatting and games, wasting a lot of time on leisure and entertainment and making self-directed learning counterproductive. Therefore, teachers can organize specialized self-directed learning training courses to teach students how to develop learning plans, use learning tools, and access learning resources. At the same time, teachers can provide guidance and advice to students to help them develop habits and skills of self-directed learning. In addition, teachers should guide students to actively utilize online platforms for self-directed learning. High quality learning resources and tools can be introduced and recommended in the course, and students can be guided on how to correctly choose and use these

resources to improve learning effectiveness. Schools can offer a variety of elective courses to meet the diverse interests and needs of students. Meanwhile, teachers can adopt heuristic teaching methods to stimulate students' interest in learning and increase their motivation for learning.

Lack of effective incentive and monitoring mechanisms: In traditional college English classrooms, teachers will timely praise and encourage students to participate in the classroom, which can enhance their learning motivation and confidence. Many English learners need to be constantly motivated in order to maintain their motivation to learn. Therefore, when students engage in self-directed learning through various online platforms, they do not receive timely motivation from teachers, which can affect their enthusiasm and lead to a loss of motivation for learning. In addition, when students engage in online self-directed learning, there is no specialized teacher to provide targeted guidance and supervision, and usually they can only rely on the teacher in charge to supervise them in addition to being busy teaching. The lack of monitoring methods has affected the effectiveness of monitoring functions, resulting in students with weak willpower being unable to effectively engage in self-directed learning. As a result, at the end of the semester, self-directed learning has become a simple practice to cope with exams, which seriously reduces the effectiveness of self-directed learning. In addition, teachers generally focus on students' learning duration, progress, and test scores in self-directed learning, but overlook factors such as methods and strategies for self-directed learning, attitudes toward online learning, and emotional factors. Therefore, teachers need to provide real-time feedback and guidance to students through online platforms, emails, and other means. This can promptly correct students' mistakes and guide them in effective self-directed learning. At the same time, teachers should work with students to determine learning goals and standards, recording their learning progress and achievements. This can help students have a clear understanding of their learning status, motivate them to continue learning, and also facilitate teacher supervision and evaluation. In addition to paying attention to students' learning progress and achievements, teachers should also pay attention to their emotional factors and understand their learning attitudes and emotional states. Furthermore, schools can establish reward and punishment mechanisms to encourage students to actively participate in self-directed learning, for example, setting up activities such as displaying learning outcomes and selecting outstanding learners to provide motivation and a sense of honor for students.

Lack of personalized feedback: Online platforms such as UCampus, WeLearn, and Haoce Reading can provide students only with feedback on standard answers, accuracy, and scores. Consequently, the inability of online platforms to provide feedback on specific types of errors and how to correct them means the platforms cannot effectively guide students to improve their learning methods, thereby affecting the effectiveness of online self-directed learning. When using online platforms for self-directed learning, one may encounter many difficulties but may not receive timely assistance, making it difficult to persist. In addition, some students only focus on the answers and scores provided by online self-directed learning platforms and cannot get more help from them. Some students even believe that online platforms have increased their learning burden. Therefore, online platforms can add online tutoring and interactive learning functions, providing students with real-time personalized feedback. Through online tutoring, students can have real-time communication with teachers, answer questions, and receive specific types of error guidance and correction suggestions. Meanwhile, interactive learning allows students to learn and discuss together with other students, helping each other and sharing experiences. Moreover, teachers should encourage students to actively participate in problem-solving and teamwork. By collaborating with classmates to solve problems, students can receive feedback and suggestions from different perspectives, helping them improve their learning methods and solve difficulties.

CONCLUSION

With the increasing importance of English, the cultivation of independent English learning ability for graduate students has become very important. Fortunately, the rise of big data technology provides

a good teaching and learning platform for teachers and students and has a huge promoting effect on cultivating graduate students' ability to learn English independently. In this era of big data, we need to think about how to effectively utilize this advantage, adopt scientific and reasonable strategies to stimulate graduate students' interest in self-directed English learning, and encourage them to actively explore in the learning process, thereby improving their self-directed learning ability and truly realizing the value of big data technology. This article explores the impact and countermeasures of the big data era on English learning through research experiments and case analysis. The research results have shown that in the era of big data, using scientific and reasonable strategies to stimulate graduate students' interest in self-directed English learning can significantly improve their learning effectiveness and self-learning ability. Specifically, through teacher strategy training, students can better understand and apply learning strategies, improve their metacognitive and cognitive strategy levels, and thus enhance their ability to learn English independently. At the same time, the application of big data technology also provides students with rich learning resources and personalized learning support, helping them better plan and manage the learning process. The research findings of this article indicate that the era of big data provides new opportunities and challenges for the cultivation of independent English learning abilities among graduate students. This not only has a positive impact on the personal development of students, but also provides new ideas and methods for educators, promoting innovation and development in English teaching. Therefore, the research results of this study have important theoretical and practical significance and are worthy of widespread promotion and application in future teaching reform practices.

AUTHOR NOTE

Data availability: The figures 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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