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Impact of Electronic Resources and Digital Literacy on Autonomous English Learners

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Abstract: *With the rapid progress of information technology, the integration of electronic resources and digital literacy into English learning is becoming increasingly prevalent. Electronic resources comprise electronic textbooks, online courses, and web-based learning platforms, among other mediums, while digital literacy pertains to individuals' aptitude in effectively employing digital technology for information acquisition, processing, and creation. Guided by the theory of foreign language autonomous learning, this article employs diverse statistical analysis and qualitative research methods to investigate and analyze the utilization of electronic resources and digital literacy among second-year non-English major students in a specific college. The findings reveal that autonomous English learners experienced a substantial increase of up to 190 weekly vocabulary additions, underscoring the potential influence of electronic resource usage on students' autonomous learning capacity. Furthermore, distinct patterns of electronic resource utilization demonstrate varying impacts on students' autonomous learning proficiency. Moreover, students' digital literacy exhibits differential effects on their autonomous learning capabilities across different dimensions.*

Keywords: *Autonomous Learning, Electronic Resources, Digital Literacy, Cognitive Ability*

1. Introduction

The acquisition of knowledge has undergone tremendous changes due to the development of information technology. The new generation of information technology, represented by the Internet, mobile communications, big data, and artificial intelligence, has profoundly altered knowledge acquisition methodologies. Consequently, foreign language educators are increasingly focusing on how to utilize information technology to cultivate students' autonomous learning ability.

Amidst the continuous development of educational informatization in China, the reform of college English teaching is consistently deepening. In this process, considerable attention has been devoted to the autonomous learning mode in foreign language teaching. Specifically, within the context of informatization, Qiu Xuyan's research and analysis on the current status of autonomous learning in English for specific purposes have led to the proposal of relevant solutions to address students' individual challenges in English learning [1]. Additionally, a study by Gueta and Maricard F has identified challenges related to the utilization of self-learning modules for distance learning. This study was designed to gather data on the challenges and coping mechanisms of teachers in module preparation, monitoring, and evaluation, as well as those of parents and students in time management, comprehension, motivation, and independent learning [2]. Furthermore, Lumapenet and Husna T adopted quantitative research methods and a quasi-experimental research design to assess the effectiveness of autonomous learning modules in enhancing students' English learning outcomes, revealing that modular learning methods have a positive impact on students' grades and achievements [3]. Nevertheless, it is important to acknowledge that the existing research exhibits a certain methodological bias.

In contemporary education, English plays an increasingly pivotal role, with college English teaching undergoing significant reform that places it at the core of the educational paradigm. Guided by the theory of self-directed learning, the crux of improving learning efficiency lies in students' possession of strong learning motivation and self-regulation abilities. Consequently, with the support of the new generation of information technology, the pressing concern lies in devising a novel classroom model that accentuates the fusion of electronic resources and digital literacy within the reform of college English teaching. This pedagogical endeavor aims to foster students' autonomous learning

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ability and constitutes a crucial problem requiring urgent resolution in higher education.

2. Utilization and Impact Factors of Electronic Resources

With the rapid development of information technology in recent years, a gradual enrichment of related information resources has been observed including the Internet, mobile communications, big data, and cloud computing. These resources have demonstrated commendable performance in facilitating knowledge acquisition, fostering exchange learning, and promoting personalized educational experiences. Consequently, online education based on mobile internet has emerged and rapidly developed in this context. Constituting an indispensable component of online education, electronic resources possess a wide variety and substantial quantity, effectively catering to learners' personalized learning needs. Nevertheless, the utilization of electronic resources is not in its presence without drawbacks, such as challenges in sustaining students' attention and limitations in fostering communication and interaction during their utilization. As a result, the field of online education has been grappling with the crucial concern of how to effectively improve learners' learning efficiency through the judicious utilization of electronic resources [4].

Influenced by various factors, therefore, the utilization of electronic resources predominantly hinges on learning motivation, learning interest, and self-efficacy. Learning motivation is characterized by a fervent desire, intrinsic drive, and constructive attitude towards acquired knowledge. The absence of intrinsic motivation may result in learners not actively engaging with electronic resources, even when external motivation is provided sufficiently. Learning interest signifies a profound fascination and zeal for the content being studied. Self-efficacy, a crucial factor, entails a robust belief in one's capability to attain a certain level of proficiency and an unwavering conviction in performing tasks competently [5].

Among the student population, three prominent modes of engaging with electronic resources are frequently observed: (1) the planned use of electronic resources mode; (2) the utilization of electronic resource models in purposeless learning; and (3) the alternating use of electronic resource patterns between purposeless learning and purposeful learning. Through meticulous investigation and analysis of students' conduct concerning electronic resource usage, a conspicuous tendency towards proactivity is evident in both primary usage modes. However, when it comes to purposeful learning, students exhibit a pronounced passive disposition. This phenomenon can be attributed to various factors: firstly, a lack of awareness regarding autonomous learning; secondly, limited familiarity with electronic resources and insufficient usage skills; thirdly, constraints pertaining to time and energy availability [6].

3. Digital Literacy and Self-Learning Ability

The exploration of digital literacy commenced in the 1990s, and as of now, no specific consensus on its definition has been reached, particularly in the context of language education. Various expressions exist regarding its meaning; however, two fundamental points of agreement prevail: firstly, digital literacy is deemed an indispensable skill for citizens in the information age; and secondly, it encompasses the capacity to acquire, comprehend, assess, and utilize digital resources. Consequently, digital literacy emerges as a comprehensive ability constituted by information processing, utilization, and innovation proficiencies [7].

Within the scope of higher education, autonomous learning epitomizes a pedagogical approach where learners actively undertake learning tasks by fully mobilizing their learning initiative, enthusiasm, and creativity. Such learners continuously discover and solve problems through independent exploration. As posited by the theory of self-directed learning, learners should possess well-defined learning goals and directions, master essential self-directed learning strategies, and be capable of harnessing positive factors throughout the learning process. College English, as a language course, seeks not only to develop students' four fundamental language skills including listening, speaking, reading, and writing, but also aims to cultivate their cross-cultural communication competencies. Consequently, fostering students' autonomous learning ability has emerged as a main objective in college English teaching. According to the theory of autonomous learning, elevating college students' autonomous English learning ability can be accomplished through the following three dimensions [8]: First of all, gaining a comprehensive understanding of one's language foundation and cultural background; secondly, cultivating one's self-learning capacity; and thirdly, selecting appropriate self-directed learning strategies. In this context, the article endeavors to analyze and discuss the aforementioned three aspects by integrating electronic resources and digital literacy.

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For English learners, autonomous learning ability characterizes a learning mode wherein learners select their learning content, monitor the learning process, evaluate learning outcomes, and perpetually enhance their learning approach based on age-stage psychological development characteristics. This autonomous learning ability can be segmented into two facets: cognitive ability and metacognitive ability [9].

3.1. Cognitive Ability

At the core of learners' ability to acquire and process information lies cognitive proficiency, encompassing the aptitude to obtain, discern, and utilize various types of information. In the Internet Age, the acquisition of knowledge has become increasingly accessible, necessitating a higher level of study skills. Learning is an active and continuous process, demanding active participation, constructive engagement, and continual refinement of cognitive abilities. By harnessing an array of digital resources for learning, learners can effectively enhance their cognitive prowess [10].

The rich and diverse digital resources available enable learners to immerse themselves in tasks of personal interest, such as reviewing materials and watching videos. Moreover, these digital resources facilitate self-monitoring and evaluation, allowing learners to discern the areas of knowledge they need to master and continuously enhance their knowledge structure.

As a result, the relationship between electronic resources and digital literacy is inseparable. Electronic resources not only furnish learners with abundant and varied learning content but also empower them to elevate their cognitive aptitude and capabilities through proficient utilization [11].

3.2. Metacognitive Ability

Metacognitive ability refers to learners' capacity to monitor and regulate their cognitive processes. It involves the skill to assess and evaluate one's learning progress, strategies, and methods, thereby facilitating self-directed learning and enabling adjustments and improvements as needed. The strength of metacognitive ability directly influences one's autonomous learning capacity. This ability includes self-awareness and resource cognition, which includes language resources, ultimately culminating in the monitoring and evaluation of autonomous learning behaviors.

In the contemporary educational landscape, electronic resources and digital technology have emerged as novel forms of digital information, providing substantial convenience to English learners. Beyond serving as mere tools, electronic resources have assumed the role of a transformative medium. By effectively leveraging electronic resources, learners gain access to a plethora of information and knowledge related to English learning, thus fostering their capacity for autonomous learning and continuous refinement of English proficiency [12].

3.3. Features of Electronic Resources

Electronic resources, existing in digital form through computer networks, exhibit a range of distinctive characteristics. Primarily, they boast a substantial quantity and capacity, accommodating diverse information resources like video, audio, and text, allowing for various expressive forms such as text, images, and videos. Secondly, electronic resources possess rapid updates and strong timeliness, ensuring swift and extensive dissemination of information [13]. Thirdly, their versatility and rich content enable diverse forms of expression, incorporating images, audio, and videos to cater to students' diverse learning needs. As a result, electronic resources offer flexibility and convenience, allowing for learning without the constraints of time and space, accessible anytime and anywhere [14].

Furthermore, electronic resources exhibit robust teaching functionalities, supporting multidirectional communication, enabling teachers to present content to students through multimedia, facilitating real-time interaction during the teaching process. It is noteworthy that electronic resources are available in various forms, catering to students at different proficiency levels, such as multimedia, empowering students to choose appropriately based on their specific requirements [15]. Additionally, electronic resources maintain high quality and strong practicality, containing rich and reliable information that satisfies the learning needs of students at various levels. Based on the above features, they facilitate personalized learning management and evaluation, allowing students to engage in customized management and evaluation hailing from their individual preferences and needs [16].

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4. Experimental Results of Autonomous Learning Evaluation

This study primarily employs three evaluation indicators for the experiment, namely, weekly vocabulary increase (Figure 1), grammar accuracy (Figure 2), and learning time utilization efficiency (Figure 3).

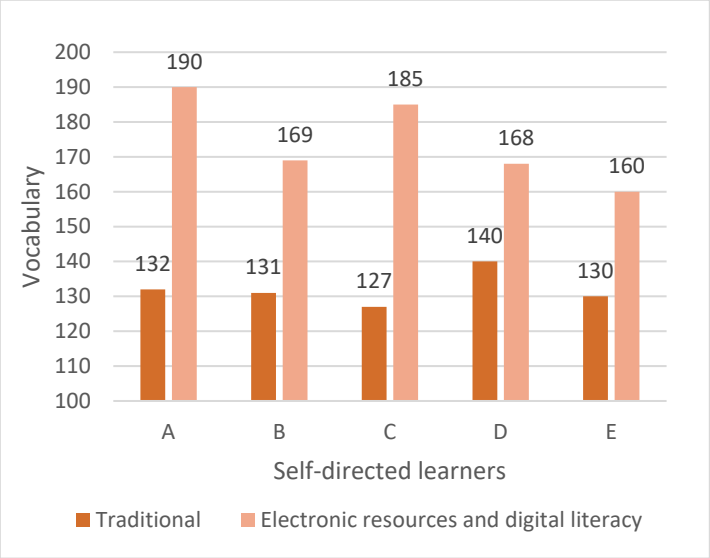

Figure 1: Vocabulary increase on a weekly basis

Figure 1 illustrates the weekly vocabulary increase among autonomous English learners utilizing traditional methods and those employing electronic resources and digital literacy. During the language enhancement training, among learners using traditional methods, the maximum weekly vocabulary increase is 140 words, with a minimum of 127 words and an average of 132 words. In contrast, among learners utilizing electronic resources and digital literacy, the maximum weekly vocabulary increase is 190 words, with a minimum of 160 words and an average of 174 words. This comparison reveals that electronic resources and digital literacy effectively enhance the weekly vocabulary increase of autonomous English learners.

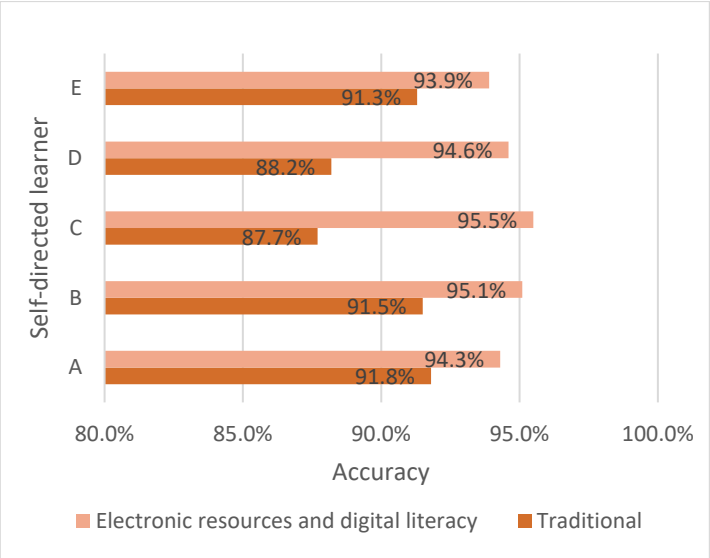

Figure 2: Grammar accuracy

Figure 2 presents the grammar accuracy among autonomous English learners using traditional methods and those incorporating electronic resources and digital literacy, based on their revised works after class. Among learners using traditional methods, the highest grammar accuracy is 91.8%, the lowest is 87.7%, and the calculated average accuracy is 90.1%. In contrast, among learners utilizing electronic resources and digital literacy, the highest grammatical accuracy is 95.5%, the lowest is

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93.9%, and the calculated average accuracy is 94.68%. This comparison reveals that electronic resources and digital literacy effectively improve the grammar accuracy of autonomous English learners.

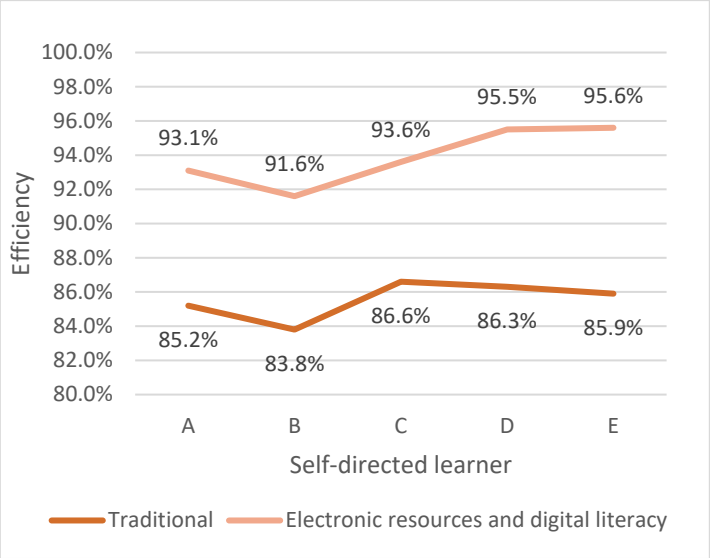

Figure 3: Efficiency of learning time utilization

Figure 3 displays the time utilization efficiency among autonomous English learners using traditional methods and those incorporating electronic resources and digital literacy. Among learners using traditional methods, the highest time utilization efficiency is 86.6%, while the lowest is 83.8%, and the calculated average efficiency is 85.56%. In contrast, among learners utilizing electronic resources and digital literacy, the highest time utilization efficiency is 95.6%, with the lowest being 91.6%, and the calculated average efficiency is 93.88%. This comparison underscores the considerable positive impact of electronic resources and digital literacy on improving the time utilization efficiency of autonomous English learners.

In addition, the article concludes by conducting a satisfaction survey on three aspects: the efficiency of using learning time, the speed of improving learning outcomes, and the quality of completing learning tasks. The results of the survey are presented in Table 1.

Table 1: Learning effectiveness satisfaction questionnaire

	Very poor	Poor	General	Good	Very good
Efficiency	4%	5%	39%	28%	24%
Speed	4%	9%	37%	26%	24%
Quality	6%	7%	37%	26%	24%

From the data presented in Table 1, it is evident that among the three evaluations, the proportion of "good" and above evaluations accounts for 50% of the responses, while the proportion of "poor" and below evaluations is less than 15%. Additionally, the proportion of "average" evaluations exceeds 35%. These findings indicate that electronic resources and digital literacy have yielded favorable outcomes in practical applications. The significant percentage of positive evaluations indicates the effectiveness and utility of electronic resources and digital literacy in the learning process.

5. Discussions

Guided by the theory of foreign language autonomous learning, the article conducts a comprehensive survey and analysis of second-year non-English major students from a specific college, focusing on their utilization of electronic resources and digital literacy. The research reveals that the time and frequency of electronic resource usage moderately impact students' autonomous learning ability, and there exist variations in the influence of different electronic resource usage patterns on autonomous learning ability. Moreover, students' digital literacy exerts diverse effects on their autonomous learning capability. Interestingly, it was observed that excessive use of electronic resources negatively impacts students' autonomous learning ability. Consequently, the provision of self-directed learning guidance should avoid excessive reliance on electronic resources [17].

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The research is anchored in the theory of foreign language autonomous learning in the context of information technology, supplemented by questionnaire surveys and interviews among college students to explore their digital literacy. Employing multiple statistical analysis and qualitative research methods, the investigation delves into the influence of electronic resources and digital literacy on college-level autonomous English learners [18].

Notably, significant discrepancies in students' autonomous learning abilities are evident among various levels of electronic resource usage. Electronic resources pertaining to document retrieval emerge as more popular and user-friendly among autonomous English learners in college, compared with other types of electronic resources. This preference may be attributed to the abundant information, high efficiency in information acquisition, and robust indexing functionalities offered by electronic resources with regard to document retrieval. Furthermore, students' utilization of electronic resources based on document retrieval has exhibited higher autonomous English learning ability than those employing other types of electronic resources. Mastery of a specific skill exhibits a positive correlation with the frequency of learners using electronic resources but a negative correlation with the duration of electronic resource usage [19].

This paper predominantly employs interview methods to comprehend students' digital literacy. During the interviews, teachers emphasize the integration of their knowledge and experiences into the teaching process, guiding students to acquire proficiency in various digital tools and technologies. Furthermore, teachers advocate students' active involvement in digital social practice activities, encouraging them to apply their acquired knowledge in practical scenarios [20].

6. Conclusions

In the contemporary information age, digital literacy assumes a paramount role in nurturing students' autonomous learning capacity. The article aims to investigate the influence of electronic resources and digital literacy on the autonomous learning ability of second-year non-English major students. Employing a combination of quantitative and qualitative research methods, the study focuses on second-year non-English major students from a specific college, aiming to comprehend their utilization of electronic resources and digital literacy and their impact on autonomous learning ability. The research seeks to offer valuable insights to educators in designing sound teaching plans and fostering students' awareness of autonomous learning.

Throughout the study, it becomes evident that learners need to exercise prudence in the utilization of electronic resources, planning their usage time and frequency rationally, taking into account their individual circumstances. When engaging in independent learning through electronic resources, it is advisable to strike a balance between self-ability training and cooperative learning. During the process of self-learning facilitated by technologies, it is crucial to emphasize the essential skills such as self-management, self-evaluation, and self-reflection. Furthermore, the article illuminates the varied effects of different types of electronic resource utilization on students' autonomous learning capacity. By elucidating the diverse impacts, this research endeavors to make a valuable contribution towards students' enhanced autonomous learning experiences, as well as optimal outcomes in the long run.

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