

# Textbook Digitization: A Case Study of English Textbooks in China

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## Abstract

The continuous promotion of e-teaching materials in the international education community prompted the Chinese government to incorporate the use of e-teaching materials in its educational system in 2010. This article introduces the different definitions of e-teaching materials in Chinese and international academia, analyzes the benefits and shortcomings of e-teaching materials by using the 2019 version of the English textbook for high school from The People's Education Press. The study employs content analysis to provide an in-depth interpretation of how task setting in three textbooks reflects an inclination towards e-teaching materials from four aspects: listening, speaking, reading, and writing. Randomly selected units in three textbooks are used to discuss how digital elements contribute to the textbooks and to the emergence of the e-learning trend. Although China's textbooks are not fully digitalized, a variety of teaching contexts, resources, and content connotations that appear in existing textbooks indicate that e-learning is now an essential element in Chinese English-learning textbooks.

**Keywords:** textbook digitalization, English textbook, electronic device, educational technology

## 1. Introduction

### 1.1 Overview

In the past few decades, due to the continuous advancement of technology the improvement in people's competencies in the use of electronic devices, there has been an increasing interest in electronic education (Qiang, 172). Textbook digitalization is one of the manifestations of e-learning. So far, the design standards for e-textbooks have not been established in the academic community. The promotion of e-textbooks is also in its infancy in many countries (Elmiana). However, previous research has delved into the feasibility of using e-textbooks. Blommaert proposed the concept of "polycentricity", stating that it is a 'context in which multiple normative complexes of a different order are simultaneously at work. (2010, p. 60)' According to You (2011), in China's megacities, such as Beijing and Shanghai, the diversity of their constituent populations makes those places have a polycentric nature. Such diverse populations need a modern approach to language teaching that makes use of the "multimodal functions of the digital technologies". Electronic textbooks are a suitable example of such teaching tools. Rose & Meyer (2002) developed the Universal Design for Learning principles that consist of "recognition, strategic, and affective networks (233)". These principles illustrate that digital textbooks help to build effective brain networks. However, there is little discussion on the trend of English language e-teaching in China. The author investigated the trend of textbook digitalization using three textbooks of the 2019 version of the English textbook for high school from The People's Education Press.

There is no uniform definition of e-textbooks in the academic community (Qin 166). Some scholars in the international education community, such as Chik (1998), believe that e-textbooks result from digitizing paper textbooks. Conversely, Park (2017) viewed e-textbooks as a category of e-books that have reading and teaching properties. Although the definition of e-textbooks in the international academic community is still controversial, most Chinese scholars have come to a consensus on the definition of e-textbooks (Pan 13). Most Chinese scholars have also extended the concept of e-textbooks. Zhou et al. (2016) argue that earlier e-teaching materials were merely electronic versions of paper-based teaching materials. They used CD-ROMs, tapes, and the Internet as carriers for traditional teaching materials. In essence, however, teaching is still based on paper-based textbooks but is supplemented by multimedia technology (Park 173). This is a definition that this paper will employ as the basis for an in-depth discussion of the trend of e-teaching materials in China.

### *1.2 History of E-Teaching Materials*

Many countries perceive advancement in e-teaching materials as a sign of modernization in the education sector (Schwartzbeck and Wolf). As early as the beginning of the 21st century, the United States government began to actively bolster the use of e-textbooks. In 2010, Houghton Mifflin Harcourt, a publisher of educational books, distributed 400 iPad textbooks to six high schools in California. Moreover, Capella University announced to students that they could freely choose e-textbooks in 1,250 courses (Barton and Lee 23).

The Singaporean government initiated the earliest attempt to use e-textbooks in Asia. As early as 1999, it was designing e-textbooks to improve teaching and learning results (Jang and Kim 430). In 2007, the Korean government began publishing Korean e-textbooks. These e-textbooks were then launched in 2011 at more than 100 schools that served as experimental sites. In 2010, the Japanese government began investing in e-textbook research (Choi et al. 398). In 2020, the Chinese government then announced that e-textbooks were an inevitable trend in textbook reform. Following this, the Shanghai Municipal Education Commission has been promoting the "E-Schoolbag" program for a period of five years, and Jiangsu Province officially launched a project to develop e-book products and to promote the use of e-books in secondary schools (Paul and K. 251).

Although the Chinese government supported the adoption and development of e-textbooks as early as 2010, full advocacy for e-textbooks has not been done. This is due to objective factors such as the lack of secondary school's campus facilities, the absence of a funding chain for relevant government subsidies, and the economic conditions of students' families. Subjective factors such as the willingness of teachers and students to use e-textbooks are responsible for partial advocacy efforts for e-textbooks ("Vocational Education"). Nevertheless, we believe that the trends and processes for using e-teaching materials are reflected in the existing constantly improved and revised teaching materials. This is shown by the existing commercially available and commonly applied teaching materials, including the characteristics of e-teaching materials in the setting of teaching tasks and the distribution of sections while still focusing on paper-based teaching materials. This amalgamation, to a certain extent, is the result of electronic advancement.

### *1.3 Criteria for E-Textbook Design*

Based on the criteria set by Fang et al. (2004), for compiling Chinese textbooks, textbook content should consider the breadth and the diversity of topics, highlight the purpose of teaching and educating people, reflect the needs of reality, meet the four aspects of listening, speaking, reading, writing, and all-round training, use authentic corpus materials, and be able to align teaching to the teaching material. Zhang (2012) recommends that Chinese secondary school English textbooks should follow this order, a gradual progression of difficulty, a holistic approach with internal echoes, and a circular approach to key content.

With the evolution of technology and the Internet, English teaching has become increasingly dependent on the use of e-resources in multimodal contexts. In 2010, the Outline of China's Medium- and Long-Term Education Reform and Development Plan (2010–2020) emphasized the need to integrate education digitalization into the overall strategy of national informatization development (Dongping et al.). To proactively adapt to the trend of informatization, the general trend of e-teaching materials is now acceptable to the Chinese education community.

Scholars from various disciplines offer complementary views on the promotion of textbooks. Morris and Chan (1997) suggest that three design elements of instructional electronic materials should be considered: the learner's ability to understand in a cognitive sense, the provision of ways for students to express what they have acquired, and the provision of diverse access to e-learning.

In addition to characteristics of traditional textbooks, E-textbooks have other characteristics. Okada and Brien (2015) suggest that the development of textbooks in the new era should focus on some principles. The first principle is synergy, i.e., textbooks should use multiple modalities, such as sounds and images to convey common meanings. The second principle is multidimensionality and consensus: materials should echo each other in all dimensions. For example, single-dimensional texts, two-dimensional graphical illustration, and three-dimensional web animation images should express the same meaning to yield better teaching and learning results. The third principle is dynamic linking of networks; for example, utilizing modern media technology to record teaching materials, the playback of classroom video screens, and using the network to establish pedagogical links. Based on this above foundation, in 2011 The People's Education Press proposed new design principles for e-teaching materials that combined paper-based and e-teaching materials into new integrated teaching materials. The new teaching materials would be compatible with students' reading habits; they would also be closely integrated with functions of the operating software. Apart from that, they would use electronic design to compensate for the absence of paper texture, and such materials would also reflect human-centered care.

Since e-textbooks' standards were proposed, The People's Education Press basically followed these standards when developing e-textbooks. The 2019 version of The People's Education Press's English textbooks available in the market in China is their latest revised version. This version has many of the characteristics of e-textbooks mentioned above. It combines a traditional book with a series of CD-ROMs, videos, and websites. Also, it is a combination of paper-based textbooks, e-textbooks, and presentation materials. Wang Junhong, deputy editor-in-chief of The People's Education Press once asserted that the e-teaching materials of the 2019 version are based on the Internet. This includes the circulation channel and digital content as the circulation medium, covering multimedia forms with images, sounds, and animations. The new book form can independently store a large amount of teaching content in its original format and preserve its integrity.

#### *1.4 Advantages of E-Textbooks*

On a macroscopic level, the emergence and promotion of electronic educational materials address students' changing learning patterns. According to Bennett et al. (2002), information technology has changed the structure of the human brain and cognitive patterns on multiple levels and in multiple dimensions. The generation of students who grew up with the Internet is known as the digital native or net generation. These characteristics that symbolize mobility and openness are in sharp contrast to the stability and rigidity emphasized in traditional textbooks.

E-textbooks overcome the limitations of traditional paper-based textbooks by using a single combination of text and pictures, but more often include pictures and audio, to convey dynamic and static information to students. E-textbooks adopt a multi-angle and multidimensional approach in conveying information such as sound, image, and animation. According to Kress and Van Leeuwen's theory (1996), the combined presentation of images and texts is more intuitive and vivid when compared to textual descriptions. Moreover, a multimodal approach to reading endears students' interest in learning. Furthermore, e-books help facilitate timely learning. Unlike traditional textbooks that have a long cycle of printing and rewriting, e-books can be updated and amended promptly.

In addition, e-textbooks allow students to conveniently retrieve information. The input method used with electronic text avails content in e-textbooks in an internet search (Luca). Conversely, the content in traditional paper textbooks can only be found by going through headings listed in the table of contents. This is time-consuming and that often yields inaccurate information. Due to the benefits accorded by traditional textbooks and prevailing Chinese government policies, e-textbooks are now an inevitable trend (Kim 170). E-textbooks will normalize students' ability to grasp the use of modern information technology, thus laying a solid foundation for cultivating high-quality human resources in the future.

This paper discusses the adoption and utilization of different elements of e-textbooks in mainstream Chinese English textbooks and the impact of the occurrence of these e-elements on the overall trend of e-textbooks in China. The study will use the 2019 English textbooks for high school students from The People's Education Press to discuss these issues.

## **2. Method**

This study used the two content analysis methods to analyze the 2019 English textbooks for high school students published by The People's Education Press. It ascertained how the content design of the three textbooks aligned with evolving trends in e-textbooks. Attention was focused on four curriculum tasks oriented to listening, speaking, reading, and writing and how those four tasks demonstrated an inclination to e-teaching materials in three aspects: their content, their digital teaching environment and resources, and their digital teaching applications.

### *2.1 The Selected Documents*

In this study, we selected the latest revised 2019 edition of the English textbooks for high school from The People's Education Press. There are 3 three textbooks for the 2019 version. The selection of the 2019 version was because they are among the most widely used textbooks in China; they encompass a trend that combines paper-based textbooks with e-textbooks, and they have curriculum and task sections designed to align with current e-teaching materials. Moreover, these textbooks served as representative of textbooks in China.

### *2.2 Procedures*

#### *2.2.1 Content Analysis on Listening, Speaking, Reading, and Writing Tasks*

The 2019 edition of the English textbooks for high school from The People's Education Press contains 15 units. All 15 units were analyzed. The author compiled statistics on the number and percentage of different task types

in four areas: listening, speaking, reading, and writing, and focused on what percentage of the four different types of tasks contained electronic elements. The comparison of the data allows a preliminary conclusion of the trend of digitalization of the textbooks in the 2019 version of the English textbooks for high school from The People's Education Press.

### 2.2.2 Stratified System Sampling

In addition to the content analysis conducted on the whole book, to further analyze the trend of e-education embodied in the three compulsory English textbooks for high school of 2019 The People's Education Press, the author also applied a stratified system sampling approach.

Each unit was assigned its own number that ranged from 1 to 15. A random sample of the 15 units was selected by using a systematic sampling procedure. When the overall capacity  $N$  is decided, (the total number of units of the textbook  $N = 15$ ), the author drew a sample with a capacity  $n = 3$ , i.e., the total number of the textbooks examined is 3. After calculating a sample spacing ( $K$ ) as follows:  $K = N/n = 15/3 = 5$ , the author randomly identified a starting point for the sampling process as the 3<sup>rd</sup> unit. After an interval of 5 units, other two samples were drawn. The sample numbers are Unit 3, 8, and 13.

While using the stratified system sampling method, the author conducted a more detailed analysis of the contents of the three textbooks. Three aspects of those textbooks are the variables under study. Specifically, the three aspects are the teaching environment, teaching resources, and teaching applications. The teaching environment refers to the content in the textbook that requires a digital teaching environment; teaching resources include e-books, electronic lecture notes, and courseware; whereas teaching applications refer to the electronic services documented in the textbook.

## 3. Results

Herein, we present the results of our analyses.

### 3.1 Listening-Oriented Tasks

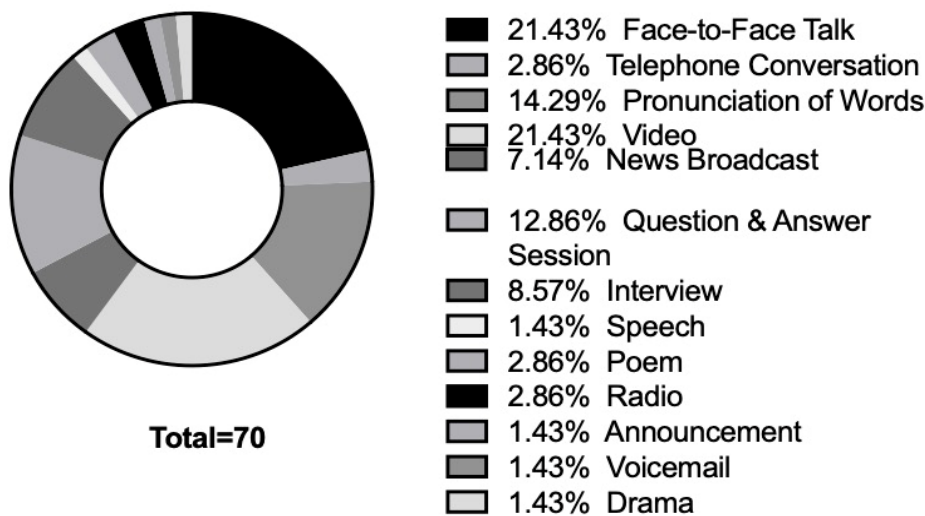


Chart 1. Types of listening activities documented in the textbooks

*Note.* In the textbooks, a listening recording may be documented more than once; this is counted as one recording when enumerating listening-oriented tasks.

Listening-oriented tasks in these English textbooks were divided into 13 categories. Each unit has between four and seven listening tasks that were evenly distributed. With the exception of the video section that was included in every unit, the frequency of listening-oriented tasks ranged from 1.39% to 25.00%.

Telephone conversation, video, news broadcast, interview, radio, announcement, and voicemail are listening exercises that simulate the application of electronic devices in real-life scenarios. These tasks accounted for 45.83% of the total listening tasks; a proportion that illustrates a trend toward digitalization in the 2019 edition of the textbooks. Listening tasks help students to better adapt to different electronic environments in different devices. Likewise, the listening materials such as telephone, radio, video, and messages also aid students to improve their digital skills and prepares them for an environment rife with evolving electronic pedagogy.

3.2 Speaking-Oriented Tasks

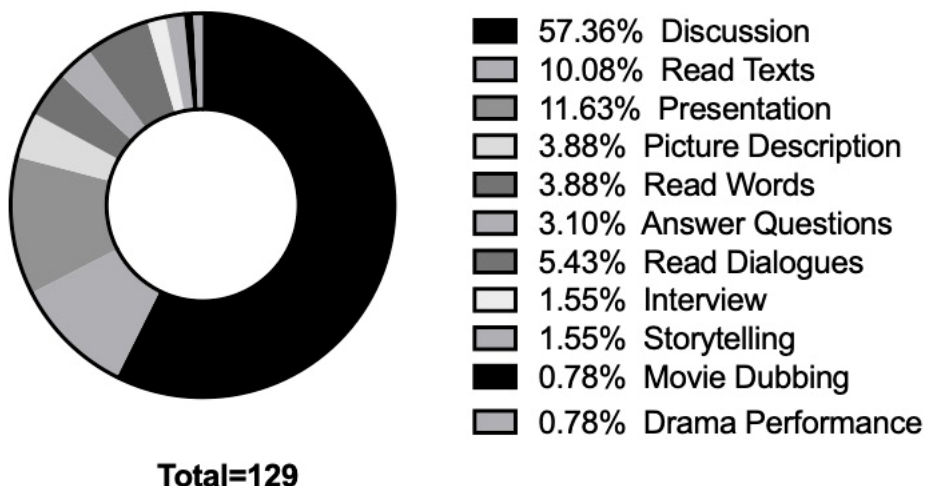


Chart 2. Types of speaking activities documented in the textbooks

The chart above shows the 11 speaking-oriented tasks found in the English textbooks studied. Each unit has an even distribution of 6 to 11 speaking-oriented tasks. Each unit had components of Discussion type in the speaking-oriented tasks. Discussion type speaking-oriented tasks were the major speaking-oriented tasks. The frequency of other speaking-oriented tasks ranged from 0.78% to 10.08%.

Among the 11 different speaking-oriented tasks, presentation tasks accounted for 11.63% of all tasks coming only second to discussion-type tasks. The presentation tasks have two major categories: one is sharing information through class presentations and the second is organizing information accessed online into presentation materials to be shared in class. China's space exploration in Unit 14, Space Exploration, is a typical example of the second type of presentation. This task requires students to look up information on China's space exploration achievements on the Internet and prepare visual slides of their results in five formats – pictures, stories, outcomes, news reports, and videos. These slides will then be presented to their classmates. All these tasks require an electronic environment.

Similarly, movie dubbing also requires a multimedia environment, including video playback facilities and speaker placement. The presence of these two types of tasks (presentation and movie dubbing) suggests, to some extent, a trend towards e-learning in the three selected textbooks.

3.3 Reading-Oriented Tasks

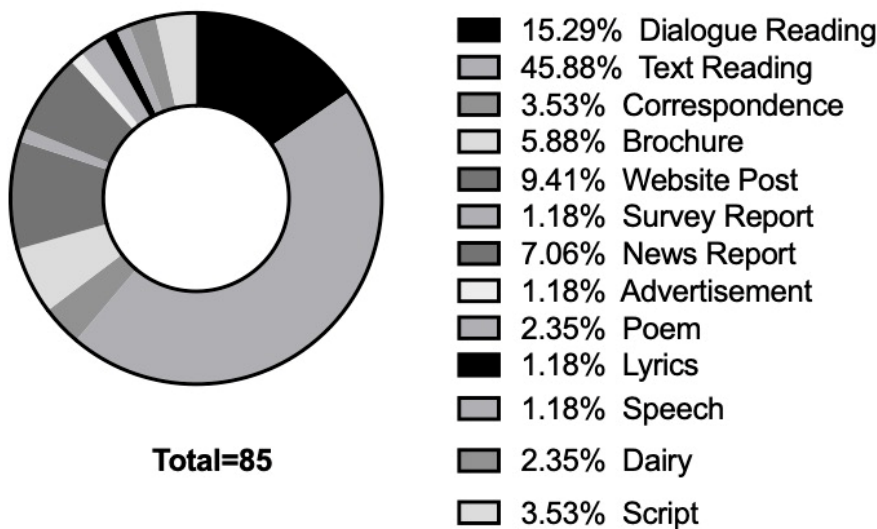


Chart 3. Types of reading activities documented in the textbooks

The illustration above shows the 14 categories of reading-oriented tasks in the three selected English textbooks. Each unit has between three and nine reading-oriented tasks. A large number of Text Reading type tasks appeared regularly in each unit, accounting for 47.78% of types of reading activities. The frequency of other reading-oriented tasks ranged from 1.11% to 14.44%.

Among the 14 different types of reading-oriented tasks, correspondence, website posts, news reports, and advertisements are all presented in an electronic environment. Specifically, all the correspondence in the textbook was presented in the form of emails. There were website posts on online forums as well as statements regarding these posts on social media platforms. The text in news reports mimicked that in the homepages of the current news media. Advertisements presented in the textbook were selected from existing electronic advertisements. All these four reading-oriented tasks simulate the regular day-to-day events in today's society that necessitate exposure to the electronic environment. This allows students to learn English concurrently with developing their awareness of the electronic world. These tasks also reflect existing trends in e-learning materials in China.

3.4 Writing-Oriented Tasks

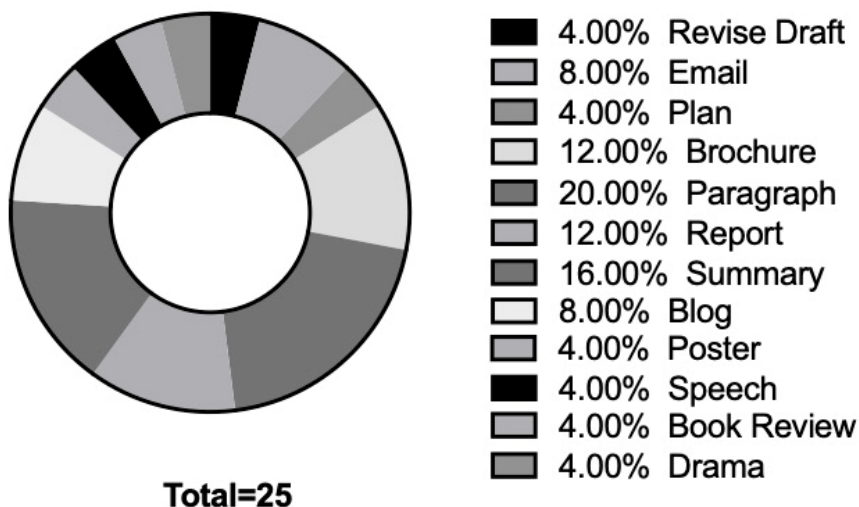


Chart 4. The types of writing activities documented in the textbooks

The chart shows 12 types of writing-oriented tasks found in the 15 units of the textbooks. Each unit had between one and three types of writing tasks. The writing-oriented tasks did not have a predominant task in each unit as was seen in the other three tasks. All of the writing-oriented tasks accounted for between 4% and 20% of in three materials, fluctuating less than listening-oriented, speaking-oriented, and reading-oriented tasks.

Among the 12 different types of writing-oriented tasks, emails and blogs simulated the use of electronic devices. This exposes students to the electronic writing environment as early as possible, develops their electronic writing abilities and their ability to use e-resources to record and communicate.

3.5 Stratified System Sampling Analysis Results in Unit 3, 8 and 13

To further demonstrate that the 2019 edition of the English textbooks for high school from The People's Education Press reflects existing trends in e-learning in mainstream Chinese textbooks, a stratified system sampling method was used to identify 3 units from the 15 units in the selected textbooks for in-depth content analysis.

Unit 3 has strict requirements for the teaching environment, teaching resources, and teaching applications. Unit 3 contains eight listening tasks; these are listening to the recording to determine the main idea, the repeated part of a sentence, to fill in the blanks, to determine the descending and ascending tones, shadow listening, text selection, sentence match, and responsive writing. These eight different listening tasks all require a modern e-teaching environment. Six tasks require facilities capable of playing recordings from CDs; one task requires recording equipment, and another task also requires typing equipment. In addition, the new 2019 textbook provides teachers with e-textbooks and handouts, as well as video resources on climbing karst landscapes that are in line with Unit 3's theme of Sports and Fitness.

Unit 8 in Book 2 focused on The Internet as a topic. This topic, which is closely related to e-education, is

comprised of subtopics ranging from Internet habits, Internet reading habits, and smartphone applications to the impact of technology on the physical and mental health of young people. Unit 8 contained an e-education theme and eight listening tasks. Unlike Unit 3, the eight listening tasks in the unit were divided into listening to audio recordings to fill in the blanks, to determine which words are repeated, of selections of textbooks, to identify the correct options, and to infer emotional tendencies. Besides, all these eight listening tasks require some form of technical support. However, completing the listening tasks in Unit 8 only requires listening equipment. The new 2019 textbook also provides e-textbooks and handouts for instructors. Unlike Unit 3, the video resources in Unit 8 closely following the unit topics, but also have speaking-oriented exercises after the videos. Thus, this unit requires an integrated audiovisual and speaking e-learning environment.

The tasks in Unit 13 of Book 3 were similar to those in the other two units. Unit 13 is comprised of the usual tasks of listening to the audio recordings to underline the repetition of sentences, shadow reading and listening to the audio recordings to fill in the blanks. Unit 13 also includes a new listening task, which is listening to audio recordings of interviews. Those audio recordings mimic a more close-to-reality English language environment in an electronic environment, such as listening to the radio or watching a video clip. Unit 13 is equipped with e-learning materials and handouts, and also has two science videos on Chinatown in California and New York, in the context of Diverse Culture. In this unit, students are called upon to express their own views on multicultural aspects in these videos. The high proportion of speaking tasks in this textbook suggests an increased need for recording equipment.

#### **4. Discussion**

With the evolution of technology in the 21st century, the use of e-teaching materials is on the increase. There is limited discussion on the use of e-learning materials in Chinese secondary school English textbooks. After analyzing the basic features of the e-textbooks in three students that are widely used in the Chinese educational community, namely the writing standards and potential advantages of the e-textbooks, the author documented the trend of e-learning that was manifested in these books.

##### *4.1 A High Demand for an E-Learning Environment*

Firstly, the contents of the three English textbooks reflected a greater need for an e-teaching environment. The listening tasks and speaking tasks in the traditional textbooks portrayed a greater demand for an e-teaching environment. In the three textbooks which the author examines, the proportion of listening tasks changed from 18.18% to 33.33%. The range of variation in this data suggests that the number of listening tasks is essentially fixed and does not change much. Excluding listening tasks that require the use of some electronic devices, almost half of other listening tasks simulate the use of electronic devices in real-life contexts. These tasks fall into one of seven categories that include telephone conversation, video, news broadcast, interview, radio, announcement, and voicemail. Such tasks reflect an increasing interest in e-teaching materials by according students with a simulated electronic life experience. Secondly, the presentation category within speaking-oriented tasks that accounted for a larger proportion of tasks also requires a specific e-teaching environment. This environment includes a visualized system for displaying slides, electronic devices for playing audio, and speakers. This need is also reflected in 'movie dubbing' tasks.

##### *4.2 Teaching Applications to Develop E-Awareness*

The development of e-awareness is mainly focused on reading and writing tasks outlined in textbooks. For reading tasks, there are large amounts of correspondence, website posts, news reports, and advertisements. Such tasks that aim to cultivate students' access to such electronic information and to strengthen learners' perception of the electronic environment, can only be accomplished in the electronic environment. Similarly, the inclusion of emails and blogs in writing tasks helps students learn how to type and use e-resources.

##### *4.3 Adequate Instructional E-Resources*

The five randomly selected five units selected were equipped with adequate instructional e-resources. In fact, all 15 units in the three textbooks were equipped with similar e-learning resources. These resources included e-video teaching resources, visual teaching slides, and e-textbook outlines. Students can utilize these e-resources for learning and also retrieve information when necessary. This mode of learning using e-resources overcomes space and time constraints imposed by traditional teaching methods and provides students with greater freedom for self-learning. In other words, the fact that more students are using e-teaching resources implies a general trend toward the digitalization of teaching materials.

## 5. Conclusion

This representative review of textbooks that are currently available in China, i.e., the 2019 edition of the English textbooks for high school from The People's Education Press, illustrates the present attitude of the Chinese educational community towards the e-textbooks. It also highlights the digital elements covered in existing textbooks and the current situation as well as China's developing trends in e-textbooks. Although several studies have described the feasibility of using e-textbooks during the current information age, a uniform definition of e-textbooks does not exist in the academic community. The limited focus has been directed to discussing e-textbooks trends in China. In this paper, the author provided a definition of an e-textbook concept complemented by multimedia technology.

More than a decade ago, countries such as the United States, South Korea, and Singapore began experimenting with electronic teaching materials. In the more developed regions of China, such as Shanghai and Jiangsu, the government already provided financial assistance to develop e-textbooks. Recent use of different e-textbooks prompted scholars to develop numerous standards for e-textbook development. For instance, our approach is based on the 2019 edition of the English textbooks for high school from The People's Education Press. E-textbooks have many advantages, they can keep up with students' evolving learning patterns, they are a more effective multimodal teaching resource, they make learning enjoyable, and they also provide a platform for information retrieval.

In this paper, the author conducted two levels of content analysis. First, the author divided the types of tasks in the three textbooks into four sections: listening, speaking, reading, and writing, and enumerated the tasks in each section. The author then compared the proportions of digital elements in the selected textbooks. From the above analysis, the three selected textbooks had more listening and reading tasks (i.e., 45.83% and 47.78% respectively). On the other hand, they had fewer speaking and writing segment tasks (13.96% and 28% respectively). The author also used a stratified system sampling method to randomly select three units from those three textbooks, counted the elements that appeared in each unit that required an electronic environment, and documented whether the specific content in each unit was related to digitalization. The three randomly selected units had a total of 22 digital elements. Moreover, the eighth unit on the theme of The Internet delved into an in-depth exploration of the use of the Internet in life and education.

Overall, the 2019 edition of the English textbooks for high school from The People's Education Press, presents us a scenario of 1) a high demand for an e-learning environment 2) a need to utilize more digital teaching applications to develop e-awareness 3) and insufficient instructional e-resources.

Educators have attempted to include electronic elements in Chinese educational textbooks to align with the constant evolution of information technology and the renewal of electronic resources. Therefore, the spontaneous inclusion of electronic elements in textbooks concurs with the learning principles. Furthermore, this process is crucial to both the digitalization of Chinese textbooks and to the improvement of the technological skills of educators.

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