


A Cognitive Semiotic Interpretation of Chinese Culture Through Digitalized Reading: When Digitalization Meets Cross-Cultural Education

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ABSTRACT

Cultural differences and geopolitical disputes severely impede the globalization process. As a method of eliminating cross-cultural misunderstandings and fostering mutual respect, it is crucial to increase cross-cultural awareness through cross-cultural education to support the world's peaceful and healthy development. This article investigates, from the perspective of cognitive semiotics, how the integration of digitization and language learning through reading can provide foreign language learners with a more immersive and stimulating learning experience. Questionnaires and interviews demonstrate that digital reading has exerted more significant learning effects on cross-cultural education than traditional paper reading. Digital reading reflects cognitive communication, cognitive subjectivity, and cognitive diversity more accurately. The integration of digital reading and cross-cultural education makes language learning more accessible and effective and can encourage students to grasp the target language while simultaneously promoting Chinese culture.

KEYWORDS

Chinese Culture, Cognitive Semiotics, Cross-Cultural Education, Digital Reading

INTRODUCTION

According to the *Report on China's Digital Reading* in 2020-2021, China's per capita digital reading was 9.1 books in 2020, and in 2021 the number reached 11.8 with the number of digital reading users exceeding 500 million. More than 200,000 books and over 10,000 periodicals are digitally published in China. This data conclusively demonstrates that the era of digital reading has arrived, with the majority of digital readers being young or middle-aged.

Digitalization makes communication and learning between different cultures more accessible and cross-cultural education is necessary due to the diversity of world cultures. The interaction between the two can improve the interpretation and promotion of Chinese culture. The development

DOI: 10.4018/IJCALLT.332230

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of digitalization is closely related to the evolution of text. Digitization is a tool for storing and transmitting symbols while text is a “unified ideographic unit” composed of symbols. The display of symbolic text is based on the two-way interaction of aggregation and combination. The ideogram of a symbolic text must be logically selected on the aggregation axis, and then the composition is produced. Because of different aggregation choices and combination ways, symbolic texts can produce different meanings and emotional biases.

Digital reading has become one of the primary means of acquiring knowledge and data. Moreover, the increase in international cultural contact emphasizes the need for cross-cultural education. Emerging research investigates the integration and mutual promotion of digitalization and cross-cultural education. Research worldwide is mostly concerned with the optimization of digital reading equipment and the selection of digital reading materials, whereas Chinese domestic research is primarily concerned with elucidating the concept and connotation of digital reading ability. In general, there are more qualitative studies than quantitative ones, the scope of existing research is relatively limited, and the research quality needs to be improved. This study examines the effects of digital reading about Chinese culture from the perspective of semiotics, conducts research on the training of cross-cultural ability among college students, evaluates the existing challenges, and seeks possible solutions.

THEORETICAL BACKGROUND

Digital Reading and Traditional Reading

Reading is a cognitive multisensory activity. According to Kintsch (1988), reading is an interactive process, in which readers actively interpret the text by integrating their own experiences and thoughts with the knowledge of the text (Perfetti & Stafura, 2014). Digital reading is a process of meaning-making from a text in a digital format. It builds on traditional print reading which usually refers to written texts in a linear way. Baron (2015) asserts that digital reading reshapes the sphere of reading, and that digital reading and traditional reading are distinct. Traditional reading requires visual attention and the tactile act of holding a physical book or pages in addition to invisible brain activity. As educational reading materials become increasingly digitalized, the impact of technological interfaces on reading comprehension has been studied. Accessibility, financial effectiveness (Daniel & Woody, 2012), and environmental benefits are the most frequently mentioned advantages of e-reading. Common disadvantages include: e-reading is not preferable for longer texts (Baron et al., 2017), e-reading is poor in holding readers’ concentration (Baron et al., 2017), and e-reading negatively impacts students’ reading comprehension (Mengen et al., 2013; Kong et al., 2018). The above-mentioned findings of e-reading are mostly monomodal, i.e., the written books are simply displayed on a screen.

Today, digital reading goes beyond traditional monomodal reading practices. E-reading is defined as any device that can display text on a screen, which makes a “multimodal interaction” (Norris, 2004) possible between the producer and his readers, and even among readers through a bullet screen. The semiotic process creates two types of representations: a text-based model, in which the reader forms their interpretant based on the sign itself; and a situation model, in which the reader forms their interpretant based on their situation (Kintsch, 2013).

Peircean Icon-Index-Symbol Triad

As ordinarily defined, a sign is something that represents, or signifies another thing to somebody. One of Peirce’s great contributions to semiotics is that he reveals a triadic relation: a sign mediates between the interpretant sign and its object (Peirce, 1958). In relation to its object, or object-aspect of sign, Peirce divided signs into three types:

- Icons, which are signs that share a similarity with their object, such as pictures, onomatopoeia in any language, or a diagram that depicts the rise and fall of a country's gross domestic product growth.
- Indices, which are signs that relate to their objects because of contiguity by brutal force, a pointing finger, an arrow, or bullet holes on a wall to signify gunfights.
- Symbols, which are signs that are determined by their objects in the sense of conventions or habits but not a similarity or physical connection to them.

Peirce also emphasized that there is no pure index, i.e., that a diagram is not a pure icon because it always comprises conventional signs, such as words. Similarly, typical conventional signs (e.g., words of any language, flags, etc.) can, in some sense, have the features of icons or indices. We may call a proper name or demonstrative or personal pronoun an index, since it can force the interpreter's attention onto the intended object without describing it. In modern semiotics, if a sign shares some properties of an icon corresponding to the content, it is called the iconicity of the sign. Take the national flag of Brazil, for example. Its image is a depiction of the southern sky as seen over Rio de Janeiro on the morning of its independence. The flag bears the feature of an icon, and thus, it can also conventionally symbolize the country. Therefore, a sign can spontaneously bear the function of iconicity, indexicality, and symbolicity.

In typical digital reading material, various sign types (e.g., visual or audio signs, icons, indices, or symbols) with collaborative meaning-making effects are presented. Images and moving images are icons, but they have additional sign roles besides iconicity. For example, in the film *Inside the Forbidden City* (Li, 1965), which is also part of the materials for the digital reading experiment in this study, the zoomed in image of the throne accompanied by solemn music is actually an indexical representation of ancient Chinese imperial power. The Chinese subtitles are symbols, but also have the sign function of indexicality assisting the Chinese audience in understanding the English narration.

Effect of Multimodal Signs in Language Classrooms

Different from the simple modality of e-reading, a text in a digital context can include moving pictures, narrations, music, captions in a mother tongue, and hypertext. The fundamental difference between traditional print material reading is that many digital reading materials nowadays are “multimodal discourses” (Kress & Leeuwen, 2001) from a semiotic sense. Inspired by Halliday's *An Introduction to Functional Grammar* (1985), meaning-making has potential in multimodal signs, namely, textual, ideational, and interpersonal meanings from different uses of semiotic resources which perform different sign functions.

Semiotics is a study of sign signification and meaning-making. Monomodal communication is in fact only applicable in some instances, such as telephone conversations, emails, and letters. Digital media are multimodal (Noth, 2019). There are combinations of various signs, such as written words, pictures, moving images, and sound, mediated through digital devices such as computers and mobile phones (Magnusson & Godhe, 2019). This is becoming a trend in language education as a multimodal semiotic approach that can make meaning-making more vivid and improve drawing students' interest in and out of class.

Multimodal signs working collaboratively contribute to meaning-making. The full repertoire of resources, such as visual signs, spoken signs, written signs and others, used in an organized way in different contexts (Jewitt, 2014) makes meaning complete. Multimodality was a term coined in the 1990s when semioticians found that language alone, either in written or oral form, is never the only mode of human interaction (Mavers & Gibson, 2012). They criticize that monomodal lingual studies are inadequate and incomplete when nonverbal signs are ignored in daily communication. In the age of screen ubiquity, digital discourse is prevalent and becoming more and more popular (Reiber-Kuijpers et al., 2021). Moving pictures, music, and captions, together with narrations, form a systemic web of signs with the effect of a synchronic collaborative information output.

METHODOLOGY

Method

All procedures performed in the study were in accordance with the ethical standards of the authors' university research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in this study.

Participants

The participants were randomly chosen sophomores and juniors from application-focused undergraduate programs in Anhui Province, China. This digital reading group was selected because it is relatively stable in terms of availability, energy, and knowledge reserves.

College students are some of the primary subjects of digital reading and exemplify digital readers in general. The digitalization of either reading content or reading methods can be well reflected by college students. This paper investigates the cross-cultural digital reading skills of college students, attempting to comprehend the current state of college students' digital reading ability and analyzing the causes of the problems in cross-cultural digital reading among college students in an effort to find practical solutions.

Instrument

This scale is based on the following two dimensions: digital reading knowledge and reading ability. The study is scientifically and rationally constructed in conjunction with interviews. The obtained data is processed and thoroughly evaluated in order to: characterize the development status of college students' digital reading skills, ascribe the current difficulties of digital reading skills, and highlight potential remedies.

The research is mainly conducted in two aspects: the basic information of the participants and the self-compiled digital reading literacy scale. The digital reading literacy scale is a self-compiled Likert 5-point scale (i.e., 1= strongly disagree, 2= disagree, 3= general, 4= agree, 5= strongly agree). According to the requirements and procedures of questionnaire preparation, 15 items of various questions are designed to test college students. After analysis, the questionnaire can be categorized into two dimensions. The first dimension, including 10 items, refers to digital reading knowledge, and the second dimension, including five items, refers to digital reading ability. After discussion by the research team, some similar items were adjusted, factor analysis was carried out again, and those with factor loading less than 0.6 were deleted. Finally, 10 items were determined to be retained. The six items in the first dimension were classified into the dimension of digital reading knowledge, which mainly refers to the understanding of digital reading, including digital reading equipment, security, software, methods, importance, and content of knowledge information. The second dimension, mainly focusing on digital reading ability, has four questions including use of the tool, prevention of piracy and illegal content, correct reference of others' achievements, and identification of security information.

Investigation Procedure

The investigation, which consists of questionnaire surveys and in-depth interviews, spanned from August 2022 to December 2022. The study is primarily qualitative, supported by quantitative analysis. To design scientific and rational questions and obtain reliable results, the authors conducted pilot analysis of the questionnaire contents on a small scale and adjusted the contents according to the feedback. The questionnaire was distributed via www.wjx.cn. The specific procedure of the investigation is as follows:

1. Using the designed questions, interviews were conducted with relevant subjects, including teachers, students, as well as staff of the university library and IT section.
2. Based on the interview results, the first draft of the questionnaire on college students' digital reading literacy was compiled in accordance with the actual situation.
3. Opinions were solicited from statistical and media teachers on the first draft, and used to modify the first draft, forming the second draft.
4. Fifty students were selected from different grades for the pre-survey. The students were invited to offer their opinions on the questionnaire contents through an informal survey. In addition, the questionnaire was tested for reliability and validity to ensure its objectivity and feasibility.
5. The questionnaire was finalized through modifications as per the pre-survey results. The final draft was entered into www.wjx.cn.

Questionnaire Distribution and Data Processing

The link to the questionnaire on www.wjx.cn was distributed anonymously via QQ and WeChat. In total, 398 questionnaires were distributed, and 390 were returned. After excluding 23 invalid responses, the authors collected 367 valid responses. The participants mainly come from application-oriented universities in Anhui Province, China, and major in liberal arts, science, engineering, arts and medicine. As shown in Table 1, 26.98% of participants are male and 73.02% are female.

Findings

The questionnaire consisted of four sections. Each section's questions correspond to a distinct facet of college students' digital reading proficiency. On a 5-point Likert scale, a score of 4.25 or higher is considered exceptional, 3.625 or higher is considered average, and 3.0 or higher is deemed acceptable.

Digital Reading Knowledge Reserve and Digital Technology Analysis

Digital reading requires a reserve of digital reading knowledge, which mostly refers to the capacity to operate digital devices and use standard digital reading software. As indicated in Table 2, the average score for respondents' digital reading knowledge reserve was 3.84, which is above the minimum acceptable level. The average score for the statement "I actively use digital devices for reading" was 3.87, which is higher than the "average" level on the scale. Thus, the college students' digital reading is facilitated by their prior knowledge of digital reading. This not only demonstrates the validity and

Table 1. Analysis on participants

	Sample class	Sample size	Percentage
Gender	Male	99	26.98%
	Female	268	73.02%
Grade	Two	294	80.11%
	Three	73	19.89%
Major	Liberal arts	241	65.67%
	Science	77	20.98%
	Engineering	37	10.08%
	Arts	0	0%
	Medicine	0	0%
	Others	12	3.54%

Table 2. Analysis on digital reading knowledge reserve

Question/Level	Totally Disagree	Disagree	Neutral	Agree	Totally Agree	Average Score
I am familiar with the software and methods of digital reading.	0%	6.27%	26.16%	50.95%	16.62%	3.76
I actively use digital devices for reading.	1.36%	2.72%	23.16%	52.59%	20.16%	3.87
I have basic knowledge of digital devices and network security.	1.09%	3%	23.71%	50.68%	21.53%	3.89

objectivity of the study, but also supports the claim that digital reading is the predominant form of reading among college students.

In terms of reading devices, 97.82% of respondents opted for smartphones, while only 10.9% preferred desktops (see Figure 1). This indicates that the convenience of digital gadgets influences their usage rate to some extent. In addition, 73.57% of respondents opted for tablets or laptops, while only 13.08% used e-book readers. Therefore, the utilization rate of digital gadgets is dependent on their functions. E-book readers are not commonly used since they lack a variety of features. Tablets and laptops support file processing, data management, and writing more effectively than smartphones. Laptops and tablets play a vital role for students in studying their majors, particularly in terms of data retrieval, text editing, data processing, and coursework. The above data analysis demonstrates that the convenience, functionality, and prevalence of digital devices are the driving forces behind the digital trend of fragmented reading. Due to variances in these three qualities, different digital devices are utilized at varying frequencies at the same time.

It is evident that college students have a fundamental understanding of digital reading and basic digital technology, scoring above average (3.625). No one “entirely disagrees” with the question “I am familiar with digital reading software and processes.” This suggests that college students do not view resource acquisition and technology utilization as obstacles to digital reading. In the modern era, digital reading has become commonplace in the daily study and lives of college students. Figure 2 depicts the results of our inquiry on the digital reading resource access methods of college students. The results are consistent with the current situation: college students use cellphones for digital reading and get information via smartphone apps.

Figure 1. Digital devices commonly used by college students

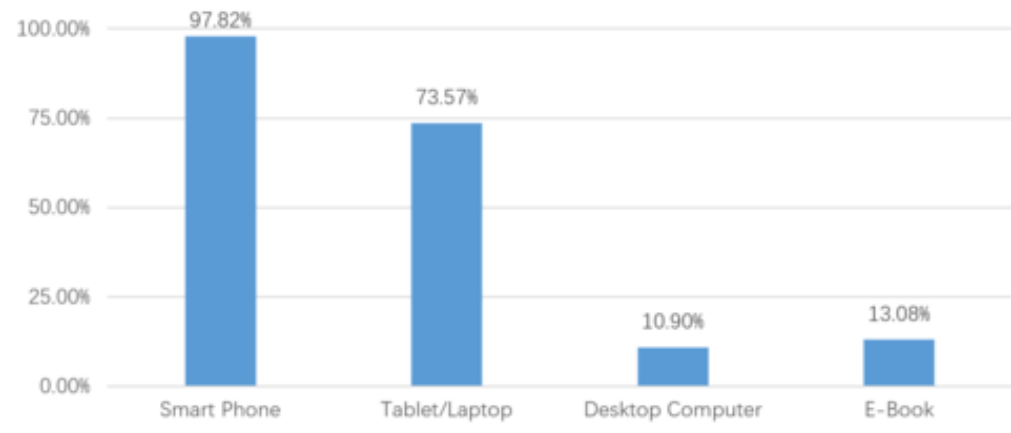


Figure 2. Access channels of digital reading resources



Basic Cognition of Digital Reading

This paper studies the basic cognition of digital reading to comprehend how college students in the modern era generally comprehend digital reading. The outcomes of the inquiry are shown in Table 3. The question “I think digital reading is important for both individuals and society” received a high score (4.1), with 81.48 percent of respondents indicating agreement. This suggests that digital reading, a product of the information age, has been embraced by most respondents and has become the norm among college students.

The score for the question “I know the advantages of digital reading over traditional reading” was 3.88, which was much higher than the acceptable and average values. More than 74.39% of respondents are aware of the benefits of digital reading over traditional reading. However, only 18.80% of respondents “completely agree”, while the majority selected “agree.” Despite acknowledging the convenience of digital reading, they do not wish to dismiss or exclude conventional reading entirely. Ultimately, the majority of respondents have acknowledged digital reading’s superiority. However, the purpose of this study is not to imply that digital reading will eventually replace conventional reading, but rather to objectively describe the trajectory of digital reading.

The above conclusion could be verified by the reasons for college students to choose digital reading. The top reason, chosen by 91.01% of respondents, is “reading anytime and anywhere”. This shows that college students have a high awareness of the “convenience” of digital reading. This novel reading method transcends the limits of time and space and enables reading in “fragmented” time. Other popular reasons for digital reading are “rich resources”, “easy to search”, and “various forms”,

Table 3. Analysis on the basic cognition of digital reading

Question/Level	Totally Disagree	Disagree	Moderate	Agree	Totally Agree	Average Score
I think digital reading is important for both individuals and society.	1.36%	0.82%	16.35%	49.05%	32.43%	4.1
I know the advantages of digital reading over traditional reading.	1.36%	2.45%	21.80%	55.59%	18.80%	3.88

chosen by 84.74%, 79.29% and 69.21% of respondents, respectively. In this regard, college students have a basic knowledge of digital reading.

In addition, as shown in Figure 3, there are four major factors that may inspire students to choose digital reading for cross-cultural communication courses, especially courses related to the dissemination of Chinese culture in English. The factor chosen by the highest percentage of respondents, 75.20%, was images and texts. This also proves that images in digital reading, especially those demonstrating the vivid forms of cultural notions, with its cognitive semiotic interpretation as indicated in Peirce's icon-index-symbol triad, may inspire better understanding of the materials and enhance students' learning.

Digital Reading Preferences

The survey on the preference of digital reading among college students is shown in Table 4. The score of "I think digital reading can satisfy my reading needs" was 3.83, higher than the "average" level. The percentage of respondents who chose the "strongly agree" option was 19.89%, while 53.13% chose the "agree" option. This once more verifies that college students take a rational attitude towards digital reading, rather than replace traditional reading with digital reading.

It also shows the possible integration between digital reading and traditional reading. That is, digital reading has certain advantages over traditional reading, and can meet the reading needs of most people; yet this does not mean digital reading can replace traditional reading. The two seemingly different reading modes actually complement each other. The respondents choose digital reading

Figure 3. Factors inspiring college students to choose digital reading

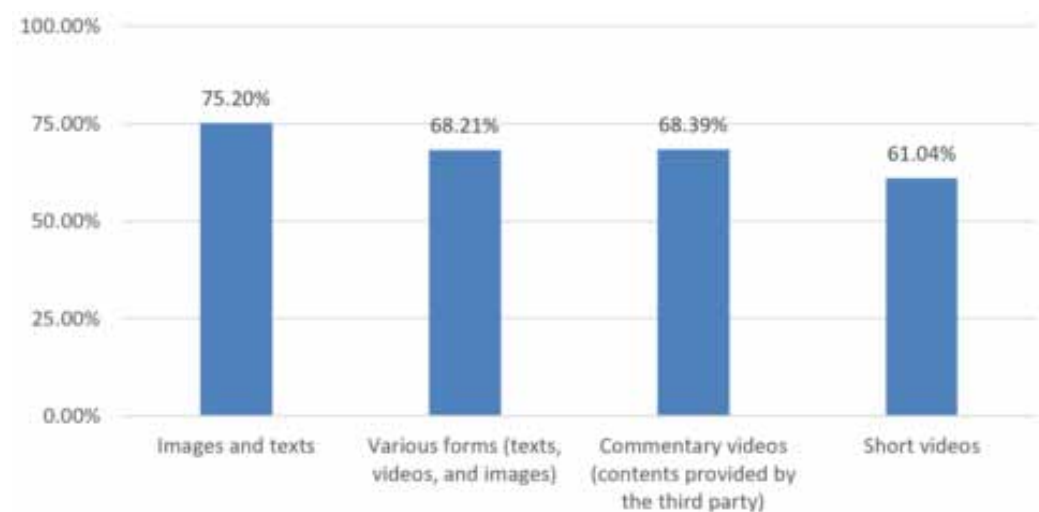


Table 4. Analysis on digital reading preferences of college students

Question/Level	Totally Disagree	Disagree	Moderate	Agree	Totally Agree	Average Score
I think digital reading can satisfy my reading needs.	1.91%	5.72%	19.35%	53.13%	19.89%	3.83
I like the diversified presentation of texts, images, and audios in digital reading.	1.63%	1.09%	16.35%	52.04%	28.88%	4.05

mainly because of its diversified presentation of texts, images, and audios, which can be verified by the results of the question “I like the diversified presentation of texts, images, and audios in digital reading.” Similarly, Figure 4 shows that the respondents prefer to read texts rich in images.

Digital Reading Comprehension, Utilization, and Transfer

About 74% of the respondents were able to obtain the desired information from digital reading and apply it to solve problems or to create their own works. However, about 25% of the respondents said they were unable to do so. Hence, comprehension of the text is a common issue in digital reading and traditional reading. The advantages of digital reading sometimes turn into disadvantages. For example, the “large amount of information” provides readers with ample references, while adding to the difficulty in pinpointing the desired information. Moreover, “algorithm-based search” and “intelligent pushes” facilitate readers to search for and read information but trap them in the digital “information cocoon”. All these would hinder the understanding and utilization of digital reading. In other words, college students are sometimes blind as to why and how to read digital resources, and their ability to understand and utilize digital resources needs to be improved. As shown in Table 5, the average score for the question “I can solve problems with the digital information obtained from reading to study and life” is 3.89. Moreover, the average score for the question “Through digital reading, I can use appropriate digital devices or software to create my own works” is 3.77.

Ethical Situation of Digital Reading

The questions in Table 6 pertain to digital reading safety and ethics. These questions were developed to assess the digital reading ethics of contemporary college students. About 32% of respondents cannot protect their personal information, 18% cannot refrain from reading unwanted content, 20% cannot

Figure 4. Digital reading resources of college students

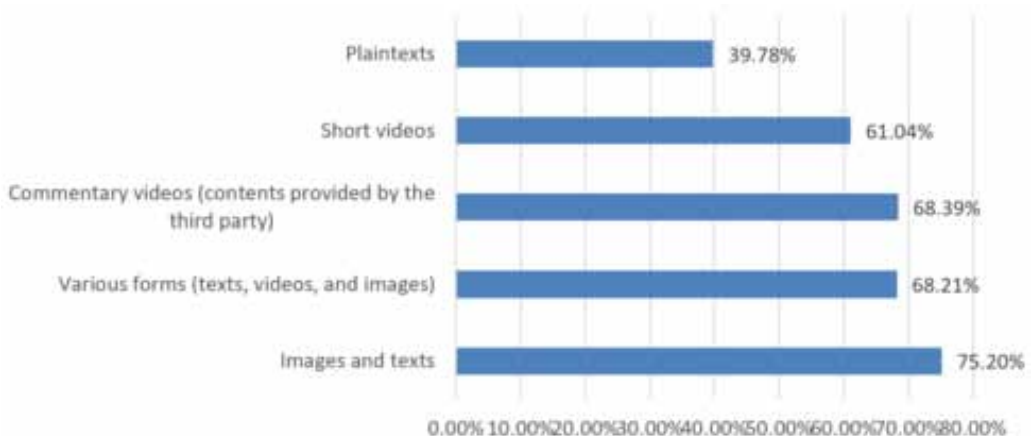


Table 5. Digital reading comprehension, utilization, and transfer

Question/Level	Totally Disagree	Disagree	Moderate	Agree	Totally Agree	Average Score
I can solve problems with the digital information obtained from reading to study and life.	1.63%	3%	20.98%	53.13%	21.25%	3.89
Through digital reading, I can use appropriate digital devices or software to create my own works.	1.36%	8.17%	20.98%	51.23%	18.26%	3.77

identify unsafe or fraudulent information in digital reading, 30% occasionally download free pirated e-books, and 19% may violate the intellectual property rights of others. Table 6 offers concrete details about the ethical situation of digital reading. As shown in Table 6, 50.41% of respondents agree and 29.43% totally agree that they can identify unsafe links or online fraud information in digital reading. This result is also positive for those who support the use of digital reading, since students can identify unsafe information and protect themselves.

In addition, through questionnaires, it was determined that there are considerable discrepancies between digital and paper reading among students of different genders and grade levels (see Table 7). Therefore, teachers should take these factors into consideration in their course design.

DISCUSSION

Cognitive Communication: The Key of Digital Reading in Interpreting Chinese Culture

The importance of cognitive semiotics lies in that it is not only an effective medium for interdisciplinary interactions, but also a powerful tool for cultural exchange. Symbols interact with each other and interpret each other, and finally construct the symbolic meaning that human beings rely on for communication.

Digital reading is one of the mainstream reading modes in the foreseeable future, and it can serve as part of the strategy to spread Chinese culture or any other culture overseas. According to the existing data, however, there is a need of better strategies for bringing Chinese culture to the outside world, with no apparent effect and reluctant acceptance. With the rapid development of interactive media, the digital industry of Chinese culture has sprung up, bringing confidence to practitioners. In addition, digital reading has the characteristics of being timely, convenient, and shareable, which will be a practical solution for Chinese culture to go global.

Table 6. Ethical situation of digital reading

Question/Level	Totally Disagree	Disagree	Moderate	Agree	Totally Agree	Average Score
I can protect my personal information from leakage through digital or network platforms.	1.63%	8.72%	21.80%	45.78%	22.07%	3.78
I can refuse to read pornographic or vulgar content.	2.18%	1.09%	14.44%	42.78%	39.51%	4.16
I can identify unsafe links or online fraud information in digital reading.	1.36%	1.63%	17.17%	50.41%	29.43%	4.05
I do not download some free pirated e-books.	3.27%	7.63%	18.80%	43.87%	26.43%	3.83
I respect others' academic achievements or creative works, and will indicate the source when reprinting others' articles.	1.63%	1.63%	15.26%	46.05%	35.42%	4.12

Table 7. Situation of digital reading and paper reading in different genders and grades (M±SD)

	Gender		t	p	Grade		t	p
	Male N=99	Female N=268			Sophomore N=294	Junior N=73		
Knowledge	23.232±4.063	23.623±4.070	-.817	.415	23.514±4.191	23.534±3.544	-0.039	.969
Competency	15.758±2.654	16.306±3.036	-1.587	.113	16.092±3.013	16.425±2.651	-0.045	.388

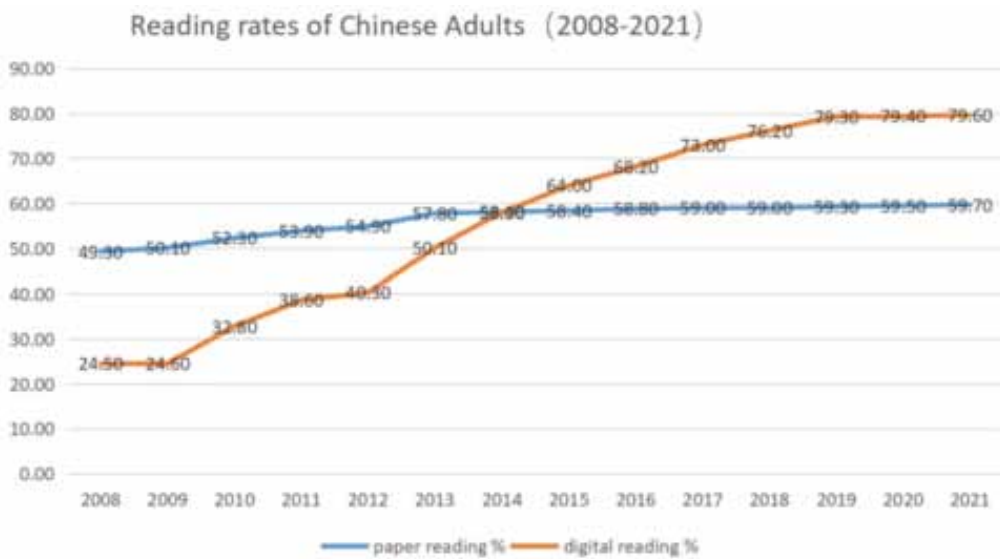
With the expansion of economic globalization and the expansion of international communication, intercultural communication has gained prominence. From a cognitive standpoint, intercultural communication research is a reformulation and reinterpretation of language communication. Consequently, the current issues of intercultural communication must be properly studied, taking into account that cognition and communication are not merely additive, but rather synergistic and mutually reinforcing each other. The greatest effect of language communication cannot be accomplished until a specific level of cognitive depth and breadth is attained, and the practice of language communication will increase the cognitive level and strengthen cognitive depth. The evolution of information technology has significantly altered the digital reading tendencies, scope, and methods of students. As illustrated in Figure 5, digital reading has become the preferred method of reading among young people.

Cognitive Subjectivity: The Focus of Digital Reading in Interpreting Chinese Culture

Digital reading is a complex symbolic system composed of the combination and arrangement of multiple signifiers. The interaction of various components in the system, as well as the diversity of readers' participation in the signified system, the disturbance of understanding intersubjectivity and digital intermodal, and the appearance of cross-cultural differences will inevitably lead to the emergence of multiple meanings in symbolic texts. The multiple meanings of symbolic texts need to be analyzed, assessed, and read by the cognitive subject to understand and master the content learned. For example, in the reading materials about *Inside the Forbidden City* (Li, 1965), Zhengren and central axis can be better experienced and more intuitively perceived through digital reading to acquire an accurate understanding of Chinese architectural culture symbols which cannot achieved with the English text of *Inside the Forbidden City* alone. Readers of simple text will not have an in-depth understanding due to the lack of awareness of Chinese architectural culture symbols. Digital reading is presented in the form of multi-mode so that the cognitive subject can better learn and understand the significance of the symbols of Chinese architectural culture.

As the study of sign systems, the basic aim of semiotic theory is to understand the structure of sign systems in relation to the way they convey meaning. Semiotics takes the view that signs can be organized within various media, to form texts that can convey some kind of meaning. For example,

Figure 5. Reading rates of Chinese adults (2008-2021)



Saussure posited that signs, in order to convey meaning, consisted of two distinct parts. Firstly, the ‘signified’, e.g., the part of the sign that pertains to its meaning, and secondly, the ‘signifier’, e.g., the part of the sign that is representative of that meaning (Saussure 1966).

Cognitive Differences: The Foothold of Digital Reading in Interpreting Chinese Culture

One of the most important factors of cognitive bias comes from the cognitive subject, whose personal or situational experience leads to the distortion of the perceptual results. The perspective of the cognitive subject is inevitably different, which also reflects cultural differences to a certain extent. Therefore, the cognitive subject is crucial to the digital interpretation of Chinese architectural culture. The cognitive difference is mainly due to the fact that digital reading carries various social, cultural, and communicative meanings of language signs. The difference in perspective is the most direct manifestation of cognitive difference. The multi-mode of digital reading enables learners to obtain multi-directional feelings, and it is dynamic while paper reading is relatively simple and static in nature.

Relevant studies have also shown that cognitive differences are related to visual processing of digital reading or paper texts, as well as whether semantic processing expectations are violated. In semiotics, a text is a collection of symbols constructed according to rules or the conventions of a particular medium or form of communication. St. Augustine defined that “A sign is something which above and beyond the impression it produces on the senses on its own account, makes something else come to mind” (as cited in Manetti, 2009: 26), that is, a sign is a thing that reminds us of another thing, and any sign itself can be translated into another sign. Through digital reading, signs may have a new form of existence and therefore produce new meanings and lead to better understanding, especially for the interpretation of cultural notions.

CONCLUSION

Despite confrontations and conflicts in the world, globalization and internationalization are irreversible trends, cross-cultural communication between countries and languages is the only way to clear up misunderstandings and build mutual respect. Digital technology presents both opportunities and challenges for cross-cultural education. Rational use of technology can not only increase learners’ interest in studying, but also provide language learners with more convenient input, output, and feedback on the target language, thereby facilitating a range of productive teacher-student interactions. The multimodal effect of digitalization is something that reading on paper cannot replicate. When cross-cultural education meets digitization, a new impetus is formed, which will promote and expedite the world’s understanding, cognition, and acceptance of Chinese culture, and help the world to better comprehend China. Cognitive semiotics is the study of the relationship between emotion, thought, and language in order to successfully express one’s own experience, thoughts, and perspectives to others. It investigates all the structures created by linguistic interaction. The research on the integration of digital reading and cross-cultural education from the standpoint of cognitive semiotics is valuable. However, the number of tested students and universities in this study needs to be increased. It is strongly recommended that future research on digitalization and other facets of language acquisition employ larger samples.

AUTHOR NOTE

The authors of this publication declare there are no competing interests. This research was supported by Chaohu University [grant number KYQD-201705].

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