Factors Influencing College Students' Deep Reading Behavior on Mobile Devices: A Grounded Theory Qualitative Analysis Postprint

Authors: WU Xinyu

Date: 2023-04-01T16:03:00+00:00

Abstract

[Purpose/Significance] To explore the influencing factors and formation mechanisms of university students' deep reading behavior, thereby enhancing their deep reading capabilities and improving reading effectiveness. [Method/Process] After conducting one-on-one in-depth interviews with 28 university students from four universities in Chongqing, substantive coding was applied to the interview content using grounded theory to investigate the factors influencing university students' deep reading behavior on mobile terminals and to construct a grounded theoretical framework. [Results/Conclusions] The study identifies reading subject, reading text, reading cognition, terminal technology, and reading environment as five principal categories influencing university students' mobile terminal-based deep reading behavior, classified respectively as dominant, critical, supportive, guarantee, and driving factors. Based on this, feasible pathways for improving university students' deep reading capabilities are analyzed.

Full Text

Preamble

Volume 65, Issue 24, December 2021
ChinaXiv Cooperative Journal

Research on Influencing Factors of College Students' Deep Reading Behavior Based on Mobile Terminals: A Qualitative Analysis Using Grounded Theory

Wu Xinyu
Southwest University Library, Chongqing 400715

Abstract:
[Purpose/Significance] This study explores the influencing factors and forma-

tion mechanisms of college students' deep reading behavior, aiming to improve their deep reading abilities and enhance reading effectiveness. [Method/Process] After conducting one-on-one in-depth interviews with 28 college students from four universities in Chongqing, grounded theory was applied to perform substantive coding of the interview content. The study systematically investigates the factors influencing college students' deep reading behavior via mobile terminals and constructs a grounded theoretical framework. [Result/Conclusion] The findings indicate that reading subject, reading text, reading cognition, terminal technology, and reading environment are the five main categories affecting college students' mobile-based deep reading behavior, serving as dominant, critical, supportive, guaranteed, and driving factors respectively. Based on this analysis, feasible pathways to enhance college students' deep reading capabilities are proposed.

Keywords: grounded theory; mobile terminal; deep reading; influencing factors; college students
Classification Number: G251
DOI: 10.13266/j.issn.0252-3116.2021.24.009

1. Research Origin

Mobile phone reading and online reading have become the primary methods of digital reading for Chinese adults [1]. With its unparalleled advantages over traditional reading—such as portability, ease of operation, and access to vast information—digital reading is quietly transforming reading habits and practices among Chinese citizens. Currently, Chinese citizens' digital reading activities focus mainly on browsing news, social networking, and watching videos, with deep book reading accounting for a relatively low proportion [2].

As the main force in digital reading, college students also spend considerable time on entertainment applications. Statistics show that their reading content primarily consists of novels, lifestyle information, and entertainment/fashion topics, with professional knowledge comprising less than 10% [3]. Evidently, while digital reading satisfies college students' social and audiovisual needs, it also accelerates the proliferation of shallow reading phenomena. Reading habits like "skimming" and "speed-reading" may lead to a lack of independent thinking and judgment. However, reading methods themselves are neither inherently good nor bad—digital reading is simply another reading choice. Its devices can store thousands of books and are highly portable, while features like bookmarks, notes, and sharing functions in reading apps can enhance reading efficiency and depth.

Therefore, in an era where digital reading has become mainstream, exploring how college students can engage in deep reading via mobile terminals holds both theoretical and practical significance. This study examines undergraduates from four universities in Chongqing as research subjects, using grounded theory to

investigate the factors influencing their deep reading behavior and attempting to construct an influencing factor model to find the key to unlocking deep thinking and improving deep reading capabilities.

Scholars both domestically and internationally have proposed different perspectives on "deep reading." Foreign scholar S. Birkerts [4] defines deep reading as slow, contemplative reading that leads to intellectual possession. Domestic scholars have primarily offered descriptive analyses of deep reading's connotation, lacking clear conceptual definitions that can lead to confusion with related concepts. Many scholars, for instance, conflate "deep reading" with "slow reading," "intensive reading," and "classic reading." In fact, deep reading relates only to reading effectiveness, not reading speed or content. The theoretical community in China has not yet unified its definition of deep reading, with representative viewpoints from scholars such as Liu Tingting [5], Ling Zunbin and Zhang Xinxin [6], and Zhou Ya [7]. Information technology continuously expands and enriches deep reading's connotation. Through literature analysis, this study defines college students' "deep reading" activities via mobile terminals as activities where students, based on their cognitive abilities and knowledge experience, fully utilize the internet and information technology to critically process reading texts and generate new reading comprehension.

Mobile terminal reading has become a widespread behavior, with reading carriers, environments, and readers themselves becoming focal points in current deep reading discussions. Regarding reading carriers, scholars like Zhang Qi [8] and Ou Jihua [9] advocate for traditional paper reading, arguing that mobile reading cannot achieve deep reading. Conversely, scholars such as Wu Yao [10] and Wang Jian and Chen Lin [11] believe no necessary connection exists between reading carrier and reading depth. Foreign scholars M.R. Bold and K.L. Wagsstaff [12], and R.P. Waxler and M.P. Hall [13] propose that during digital reading, mobile terminal functions like screen locking and hyperlink jumping affect deep reading effectiveness, and that annotation and searching are less convenient than in paper reading. The reading method itself has no inherent superiority; reading effectiveness is closely related to readers' subjective initiative. Li Guihua [14] argues that the key to deep reading in the digital age is promoting readers' cognitive formation and enabling them to fully utilize information technology to participate in reading activities. Regarding readers' capabilities, scholars like Wu Qiong and Zhang Yue [15] and Li Fanjie and Li Guihua [16] have focused on reading motivation, attitudes, and cognition in deep reading. Concerning reading environment, Qiu Xiangbin et al. [17] suggest that tidy, quiet reading environments and good network conditions more easily trigger deep reading behavior, while Xu Ya [18] found that digital reading in libraries and study rooms has a significant positive impact on deep reading engagement.

As the main force in digital reading, many scholars have explored college students' deep reading via mobile terminals through empirical research, analyzing whether electronic reading tools can influence deep reading effectiveness. Xu Ya [19], referencing the "Three Bodies" theory, social cognitive theory, and the 5W

linear communication model, designed a questionnaire and proposed research hypotheses on factors influencing college students' deep reading behavior. Yu Honglei found that college students' reading motivation is primarily entertainment rather than knowledge improvement. Qiu Xiangbin et al. [18] studied the impact of college students' shallow reading behavior on five dimensions of deep reading—focus, comprehension, etc.—in the big data era. Wu Jian et al. [20] argue that college students' addiction to shallow reading is detrimental to their physical and mental health. Scholar Chai Yangli [21] designed and controlled college students' digital reading activities to explore whether auxiliary reading technologies like annotation and sharing could improve deep reading effectiveness.

Existing literature shows that most research focuses on how new media's rapid development changes citizens' reading methods, with conclusions simply noting that digital reading tends to cause "shallow reading" and suggesting deep reading activities to cultivate good habits. Few studies examine strategies to promote deep reading, and proposed strategies often remain at the theoretical level without practical operability. College students are an important group for comprehensive reading, and their reading depth, breadth, and effectiveness directly or indirectly represent the reading capabilities of the entire population. Therefore, this study comprehensively analyzes the influencing factors of college students' mobile-based deep reading to explore feasible pathways for improvement.

---

2. Research Design and Data Analysis

2.1 Research Design

Based on grounded theory methodology, this study used NVivo12 software for data coding and categorized relevant concepts. The research aimed to deeply explore factors influencing college students' mobile-based deep reading and analyze the logical relationships among these factors, ultimately forming a systematic theoretical explanatory model. The research process was divided into four stages: interview preparation, data collection, initial coding, and coding composition [22]. Since questionnaires are difficult to design without the researcher's subjective influence, and to avoid preconceived assumptions while ensuring objectivity and comprehensiveness of the data, this study adopted in-depth interviews for data collection. Through one-on-one free exchanges with interviewees, the study attempted to extract information related to the research theme from interview texts and analyze influencing factors from multiple angles. The interview outline is shown in .

** Interview Outline Design for Influencing Factors of College Students' Mobile-Based Deep Reading**

Interview Purpose	Interview Questions
Understanding views on deep reading	Do you know what deep reading is? How do you view the cultivation of deep reading ability?
Understanding the relationship between mobile terminals and deep reading	Have you engaged in deep reading behavior through mobile terminals? How does fragmented information on mobile terminals affect your deep reading? What do you think are the advantages and disadvantages of using mobile terminals for deep reading?
Understanding reading methods and habits	What mobile terminals do you use for reading? What content do you prefer to read? Do you often engage in deep reading? How long do you read daily? When do you prefer to read deeply? Do you have specific requirements for reading locations and scenarios?
Understanding deep reading effects	Do you annotate, comment, share, or forward when reading on mobile terminals? What profound insights do you gain from deep reading? What kind of thinking does it generate?
Understanding dilemmas of mobile-based deep reading	What do you think prevents deep reading on mobile terminals? What factors affect deep reading effectiveness and what strategies do you use? What difficulties have you encountered in mobile-based deep reading and how did you solve them? What factors do you think affect deep reading from your perspective? How do you think deep reading effectiveness can be improved?

2.2 Data Collection

Through random sampling, this study selected 28 interviewees from four universities in Chongqing: Chongqing University, Southwest University, Chongqing University of Technology, and Chongqing Technology and Business University. Seven participants were selected from each university with balanced gender ratios, covering majors in literature, education, management, history, engineering, agriculture, science, and philosophy. Sample size determination followed the principle of theoretical saturation. Basic information about interviewees is detailed in .

We conducted 30-minute in-depth interviews with participants via audio recording, asking them to truthfully describe factors influencing their mobile deep reading, their reading preferences and habits, and their views on paper versus mobile reading.

---

3. Category Extraction

3.1 Open Coding

Open coding refers to the process of decomposing, comparing, conceptualizing, and categorizing collected data at the beginning of research [23]. Through cluster analysis, raw data were classified and named from conceptual and dimensional perspectives. Conceptualization involves extracting content from original comments, breaking them into independent sentences, extracting coding elements from these sentences, and transforming colloquial language into refined language to form preliminary concepts. Concept classification involves optimizing, analyzing, and screening concepts, clustering concepts of the same category to analyze connections between words and form conceptual clusters belonging to the same category. Categorization involves further abstracting and naming these conceptual clusters. Using NVivo12 Plus's free coding function, this study coded and labeled the collected interview data word by word without any researcher preset or bias, generating initial concepts and discovering conceptual categories from raw materials. The open coding results are shown in , yielding 36 categories (A1-A36): reading comprehension (A1), reading reflection (A2), reading application (A3), immediate experience (A4), community exchange (A5), reading mindset (A6), reading frequency (A7), reading time (A8), reading method (A9), task-based learning (A10), self-cultivation (A11), self-entertainment (A12), information input (A13), resource acquisition (A14), reading location (A15), reading atmosphere (A16), reading platform (A17), device usability (A18), electronic marking (A19), payment and tipping functions (A20), search function (A21), immediate needs (A22), long-term goals (A23), shallow reading (A24), deep thinking (A25), enhanced reading experience (A26), knowledge system improvement (A27), exam preparation (A28), readability (A29), aesthetics (A30), inspiration (A31), timeliness (A32), practicality (A33), professionalism (A34), mobile devices (A35), and paper resources (A36).

** Example of Initial Coding from Interview Data**

Original Statements (Initial Concepts)	Refined Concepts
“I think at the beginning we need to choose books we’re interested in and determined to read well. This can give us psychological 暗示, 暗示自己需要认真读完这一文学作品或者经典著作，关闭阅读软件的通知以及设备推送的消息，帮助自己保持注意力的集中，加强阅读的专注力”	Maintaining focus
“Deep reading’s understanding and absorption is more about overall 感悟而非逐字逐句的理解，一般会结合自身情况，思考跟自己相关的部分，比较容易产生共鸣和思考…”	In-depth understanding
“Habit formation requires 日积月累地努力，需要发挥个体的主观能动性，一次次地加长阅读时间，或者是在阅读后写读书笔记，做一个总结和反思…”	Focus and reflection
“When reading, I remember keywords and the article’s structure. This helps me better review and summarize after reading. I generally engage in deep reading twice a week.”	Summary and review
“Learning about difficulties and setbacks through these books makes me think about future life perspectives…”	Practical guidance
“In each reading, I feel immersed, probably because reading provides rich imaginative material to the brain…”	Immersion
“Reading in a relaxed state brings deeper immersion and more profound feelings about the story…”	Leisure reading
“I bought some e-book resources on Taobao and joined a Baidu Netdisk group with various book shares.”	Sharing community
“On Weibo, books you like usually have topics. Browsing these topics helps you find like-minded readers.”	Weibo sharing
“When I have uninterrupted time, I engage in deep reading, which brings a very relaxing experience…”	Enjoyment
“I usually read deeply in the afternoon or evening for about 6 hours, habitually organizing keywords and sometimes making mind maps…”	Evening study
“The time period isn’t fixed, as long as time is sufficient and uninterrupted. Duration is 2-3 hours…”	Occasional reading
“Personally, I prefer reading at night after finishing my studies, for about 3 hours…”	Night study
“In terms of mental state, I definitely choose morning when there are fewer distractions…”	Morning reading

Original Statements (Initial Concepts)	Refined Concepts
"Mainly for convenience. For example, with a phone, you can engage in deep reading anytime, anywhere…"	Fragmented reading time
"Because it's deep reading, concentration is higher and reading speed slower. When reading on computer, I can use highlighters…"	Annotation and notes (mind mapping)
"For example, when browsing WeChat official accounts, I collect good articles…"	Collecting official account articles
"Generally choosing professional knowledge content helps me understand my discipline better…"	Learning professional knowledge
"The experience deep reading brings me is enjoyment—acquiring knowledge and internalizing it…"	Self-improvement
"Deep reading better fits my reading habits. Choosing interesting content creates a stronger reading mindset…"	Interesting content
"For instance, if a WeChat official account recommends ways to overcome procrastination, I'd be very interested…"	Platform recommendations

3.2 Axial Coding

Axial coding is a crucial step in grounded theory. In this process, concepts and categories are fully connected based on objective conditions, logical contexts, action strategies, and outcomes of phenomena. By examining hierarchical interconnections and logical relationships among concepts, major and minor categories are distinguished. Through comparing similar concepts, relationships between major and minor categories are explored to discover more abstract, overarching, higher-level categories—namely, main categories [24]. During axial coding, special attention must be paid to the original context and underlying meaning of initial concepts to ensure reasonable associations between them, as shown in [Figure 1: see original paper].

Based on internal relationships and logical primary-secondary relationships, the 36 categories (A1-A36) obtained from open coding were re-summarized and clustered into 14 main categories (B1-B14): deep reading ability, deep reading psychology, deep reading habits, target environment, information environment, surrounding environment, technology adaptation, technology application, reading purpose, reading experience, reading motivation, text content, text quality, and reading carrier. The axial coding results are shown in .

** Main Categories Formed Through Axial Coding**

Main Category	Subcategories	Concepts
Reading Subject	B1 Deep Reading Ability	A1 Reading Comprehension: maintaining focus, understanding structure, cultivating deep reading ability, daily accumulation, in-depth understandingA2 Reading Reflection: absorbing others' views, related reading, focus and reflection, summary and reviewA3 Reading Application: practical guidance, interest orientation, demand orientation

Main Category	Subcategories	Concepts
	B2 Deep Reading Psychology	A4 Immediate Experience: immersion, relaxed state, restlessness, curiosity, leisure readingA5 Community Exchange: Douban book reviews, sharing communities, social platforms, book clubs, Weibo sharing, reading socializationA6 Reading Mindset: enjoyment
	B3 Deep Reading Habits	A7 Reading Frequency: frequent, occasionalA8 Reading Time: evening study, fragmented reading time, morning reading, uninterrupted timeA9 Reading Method: note-taking, collecting articles, recommending to others, mind mapping

Main Category	Subcategories	Concepts
Reading Environment	B4 Target Environment	A10 Task-based Learning: learning professional knowledgeA11 Self-cultivation: self-improvementA12 Self-entertainment: personal interest, browsing news, platform recommendations
	B5 Information Environment	A13 Information Input: reducing external interference, homogeneous push notifications, entertainment function interference
	B6 Surrounding Environment	A14 Resource Acquisition: obtaining resources through reading softwareA15 Reading Location: quiet reading environmentA16 Reading Atmosphere: quiet atmosphere, lighting, pre-sleep relaxation, listening to music

Main Category	Subcategories	Concepts
Terminal Technology	B7 Technology Adaptation	A17 Reading Platform: Amazon online store, CAJviewer, PDF text, Baidu Netdisk, electronic library, other APP platforms, WeChat Reading, Zhihu, CNKIA18 Device Usability: electronic device fatigue
	B8 Technology Application	A19 Electronic Marking: comment sections, annotations and notes, copy-paste, highlighter, underlining, audiobook function, fluorescent penA20 Payment/Tipping Function: paid knowledgeA21 Search Function: search engines, resource sharing

Main Category	Subcategories	Concepts
Reading Cognition	B9 Reading Purpose	A22 Immediate Needs: connecting knowledge, translation and reference, completing assignments, self-entertainmentA23 Long-term Goals: clear objectives, practical value, improving analytical ability
	B10 Reading Experience	A24 Shallow Reading: pop-up windows affecting experience, inconvenient note-taking on mobile, shallow mobile readingA25 Deep Thinking: entering author's spiritual world, contemplating lifeA26 Enhanced Reading Experience: convenient saving, mobile convenience, dialogue with content
	B11 Reading Motivation	A27 Knowledge System ImprovementA28 Exam Preparation

Main Category	Subcategories	Concepts
Reading Text	B12 Text Content	A29 Readability: reading novels, no ad push, fragmented useless information affecting deep reading, story contentA30 Aesthetics: few ads, beautiful interface, screen resolutionA31 Inspiration: knowledge accumulation, easy to overlook details
	B13 Text Quality	A32 Timeliness: small content volume, quick acquisition of fragmented knowledge pointsA33 Practicality: low efficiency and insufficient depth, emphasizing content quality, emphasizing practicalityA34 Professionalism: theoretical content, professional or humanities/social science content, reading professional literature

Main Category	Subcategories	Concepts
	B14 Reading Carrier	A35 Mobile Devices: iPad, Kindle, mobile reading, mobile convenience and affordability, computer deep reading, distraction of focus, rich resourcesA36 Paper Resources: expensive physical books, paper reading, paper reading aids memory

3.3 Selective Coding

Selective coding further associates the several core main categories formed during axial coding, analyzing hierarchical relationships among different main categories through continuous comparison, exploration, and coding. Under this core category, several main categories form typical relational structures, constructing a theoretical model with a storyline and explaining its structural relationship connotation. Saturated verification of respondents' initial statements ensures the authenticity and validity of this research from both reliability and validity perspectives. Typical relationships among main categories are shown in .

** Typical Structural Relationships of Main Categories**

Relationship Structure	Connotation
Reading Subject → Deep Reading	Individuals' reading ability, psychology, and behavior directly affect deep reading behavior and effectiveness
Deep Reading → Reading Subject	Deep reading experience affects reading subject's experience, mindset, and frequency

Relationship Structure	Connotation
Reading Environment → Deep Reading	Target environment, information environment, and surrounding environment affect deep reading behavior and effectiveness in different contexts
Reading Text → Deep Reading	Text content and quality affect deep reading behavior and effectiveness
Terminal Technology → Deep Reading	Technology adaptation and application degree affect deep reading effectiveness
Reading Cognition → Deep Reading	Deep reading effectiveness is driven by reading motivation, purpose, and experience

4. Model Construction and Mechanism Explanation

4.1 Model Construction

The five main categories—reading subject, reading text, terminal technology, reading environment, and reading cognition—significantly influence college students' mobile-based deep reading behavior. The reading subject plays a dominant role in deep reading activities and constitutes the dominant factor affecting deep reading effectiveness, including deep reading ability, deep reading psychology, and deep reading habits. Reading text includes reading carriers, text content, and text quality selected by college students when reading via mobile terminals, representing the critical factor affecting deep reading effectiveness. Compared with paper texts, mobile devices are more popular among college students due to their portability and searchability. Similarly, college students prefer simple, easy-to-understand, and entertainment-oriented content. The terminal technology category refers to college students' use of technical means to enhance deep reading effectiveness, representing a supportive factor that mainly includes platform selection, device usage, and resource retrieval. Reading environment refers to the reading atmosphere created to improve deep reading effectiveness, mainly including target environment, information environment, and surrounding environment—a good reading environment is the guaranteed factor affecting deep reading effectiveness. Reading cognition refers to reading purpose, reading experience, and reading motivation, which are the driving fac-

tors affecting deep reading effectiveness. Reading activities based on certain motivations and goals yield better reading experiences and effectiveness. Based on this analysis, the author constructs a theoretical model of influencing factors for college students' mobile-based deep reading behavior, as shown in [Figure 2: see original paper].

[Figure 2: see original paper] Theoretical Model of Influencing Factors for College Students' Mobile-Based Deep Reading Behavior

4.2 Mechanism Explanation

4.2.1 Reading Subject → Dominant Factor The reading subject is the dominant factor affecting deep reading effectiveness, with influence pathways mainly including: (1) Deep reading ability refers to a capacity for dialogue and exchange with reading texts developed through long-term reading activities, which can improve one's knowledge and thinking level. Deep reading ability is mainly manifested in readers' understanding, reflection, and application of reading texts—constructing knowledge systems and improving information literacy based on understanding textual meaning. (2) Deep reading psychology includes immediate experience, community exchange, and reading mindset. Immediate experience refers to a psychological reaction where individuals form immediate and profound impressions in their brains after external stimulation. Good immediate experience means truly absorbing the essence of books during reading activities and integrating it into one's knowledge system. Community exchange is a way for groups with similar needs, interests, and values to communicate with each other. Mobile-based deep reading is internet-based, using social software for book sharing and communication, where thoughts and viewpoints collide to achieve better deep reading effectiveness. Reading mindset refers to the attitude and resulting psychological activities readers maintain during reading. Different reading content brings different reading mindsets—obscure content may cause frustration, while entertaining and interesting content is more popular. (3) Deep reading habits include reading frequency, reading time, and reading methods. Good reading habits are reflected in reading time and frequency, helping college students maintain efficient reading states without being disturbed by mobile device notifications, ultimately achieving good deep reading effectiveness.

4.2.2 Reading Text → Critical Factor Reading text is the critical factor affecting deep reading effectiveness, with influence pathways mainly including: (1) Text content refers to what college students read during deep reading, including news, online literature, classics, and professional books. Text content should be evaluated based on readability, aesthetics, and inspiration. Readability refers to the text's appreciation value, aesthetics refers to mobile device screen size, resolution, and reading software page settings and pop-up ads, and inspiration refers to whether the text can guide students toward autonomous learning and independent thinking. (2) Text quality refers to whether the content possesses timeliness, practicality, and professionalism. College students particularly em-

phasize text quality during deep reading, often selecting appropriate texts based on their reading needs, such as academic literature or professional books. Having clear reading goals often leads to better deep reading experiences. (3) Reading carrier—this study discusses only mobile devices like smartphones, Kindle readers, and laptops, excluding paper resources. Mobile devices can store thousands of books, and features like bookmarks, notes, sharing, and comments can greatly improve reading efficiency and depth.

4.2.3 Reading Cognition → Driving Factor Reading cognition is the driving factor affecting deep reading effectiveness, with influence pathways mainly including: (1) Reading purpose, divided into immediate needs and long-term goals. Immediate needs refer to short-term deep reading demands generated by current learning tasks or self-entertainment, which stop once goals are achieved. Long-term goals refer to deep reading plans formulated by college students to improve their literacy, build knowledge systems, and enhance future employment competitiveness. (2) Reading experience refers to psychological experiences during mobile terminal reading, including shallow reading and deep thinking. Using mobile devices for deep reading is easily disturbed by system information and pop-up reminders, dispersing readers' focus and leading to insufficient thinking depth and poor reading effectiveness. (3) Reading motivation includes improving knowledge systems and exam preparation. Reading needs affect deep reading willingness, which in turn affects deep reading effectiveness. Correct reading attitudes, attempts at independent thinking, and targeted reading are the proper ways to improve contemporary college students' reading abilities.

4.2.4 Terminal Technology → Supportive Factor Terminal technology is the supportive factor affecting deep reading effectiveness, with influence pathways mainly including: (1) Technology adaptation, including reading platforms and device usability. College students mainly conduct deep reading on platforms like Amazon online store, CAJviewer, PDF readers, Baidu Netdisk, electronic libraries, WeChat Reading, Zhihu, and CNKI. Prolonged reading on mobile terminals causes visual fatigue and attention dispersion. Many e-reading platforms now offer eye protection modes to adjust page colors and font sizes, while Kindle e-readers provide paper-like pages and built-in reading lights to enhance deep reading effectiveness. (2) Technology application refers to search, marking, and payment/tipping functions used during deep reading. Resource retrieval refers to searching for information via search engines when encountering difficult problems. As society promotes paperless learning and office work, mastering electronic marking functions on mobile devices is essential for underlining key points and adding remarks. Payment and tipping functions refer to knowledge payment platforms like Ximalaya FM, Dedao, and Fenda, where college students can quickly obtain professional, systematic, and high-quality information through payment, saving time on information screening.

4.2.5 Reading Environment → Guaranteed Factor Reading environment is the guaranteed factor affecting deep reading effectiveness, with influence pathways mainly including: (1) Target environment refers to reading goals held during deep reading, roughly divided into task-based learning, self-cultivation, and self-entertainment. Task-based learning refers to deep reading activities guided by schools and teachers according to curriculum arrangements to improve students' knowledge and professional abilities. Self-cultivation refers to students' autonomous extracurricular learning based on interests and professional directions to improve comprehensive abilities. Facing busy schedules and academic pressure, many students relax by browsing romance novels and funny stories for self-entertainment. (2) Information environment refers to the overall environment with communication characteristics that groups or individuals encounter in society, mainly manifested as information symbols with specific meanings like images, sounds, text, and graphics. The deep reading information environment mainly includes information provided by media and self-acquired resources. The media-provided information environment is not a reproduction of reality but an environment processed, refined, and combined before being delivered to users. College students often receive large amounts of boring, false, sensational, and entertaining information during deep reading and need self-discipline to avoid external interference. College students' information literacy ability determines how many information resources they can access—students with high information literacy can quickly identify information authenticity and value to decide whether to select texts for deep reading. (3) Surrounding environment refers to the environment and atmosphere where college students conduct deep reading. University libraries are excellent venues for deep reading, where comfortable environments, reasonable layouts, complete facilities, and good learning atmospheres often bring better deep reading effectiveness.

---

5. Conclusions and Recommendations

5.1 Improve Information Literacy and Cultivate Good Reading Habits

In the information age, increasing amounts of learning and work require the internet. How college students use the internet and information technology for efficient learning has become a focus of talent cultivation in Chinese universities. Mobile internet attracts numerous netizens to obtain needed information via mobile terminals, college students included. Mobile-based deep reading involves processes of information discrimination, selection, utilization, and processing, requiring not only extensive knowledge and effective information acquisition/processing abilities but also high information literacy. Improving information literacy requires strengthening sensitivity to needed information, discovering potential information value, and learning information integration and processing. Additionally, mobile-based reading is prone to interference and attention dispersion. Only by maintaining focus and eliminating external distractions during reading can smooth reading activities and efficient reading

states be ensured. Therefore, contemporary college students should not blindly pursue easy, entertaining shallow reading or develop loose, lazy reading habits for momentary pleasure. Instead, they should cultivate reading habits combining shallow and deep reading. When facing obscure professional books, they must step out of their reading comfort zone, solidify their professional foundation, and enhance future employment competitiveness.

5.2 Utilize Reading Assistive Tools and Master Electronic Marking Functions

College students should leverage mobile device advantages as important means to enhance reading experience, improving autonomous reading abilities through enhanced reading cognition and diversified reading methods. Generally, mobile phones, e-readers, and tablets are the main carriers for college students' deep reading. Mobile phone reading is convenient with numerous app options. E-readers have single-function advantages with minimal external interference, helping maintain focus during reading, while their paper-like screens greatly enhance reading experience. Tablets combine mobile phone functions with more comfortable screens but are less portable. College students can select and utilize mobile devices for deep reading according to their needs. During deep reading, they should cultivate habits of underlining and annotating key texts, reading with questions to enhance interactive awareness and deepen reading effectiveness. Annotating texts during reading can highlight key points, clarify thinking, raise questions, express insights, and increase reading engagement, maximizing deep reading effectiveness.

5.3 Develop "Metacognitive" Ability and Improve Autonomous Reading Ability

"Metacognitive" ability refers to college students' conscious regulation of information processing skills through autonomous learning after understanding their cognitive characteristics and capabilities, and reflecting on their learning status and cognitive strategies [25]. During deep reading activities, college students should have clear cognition of their reading abilities and goals, consciously selecting appropriate texts to improve deep reading effectiveness. Developing metacognitive ability mainly involves cultivating autonomous reading ability—retrieving needed information based on personal interests and professional directions, then understanding, utilizing, and reorganizing it to form personal knowledge systems. To improve autonomous reading ability, students must first establish proper reading concepts: reading for pleasure, not just for reading's sake. Second, they should strengthen deep reading abilities, utilize reading assistive technologies, and cultivate independent thinking habits. Finally, they should engage in deep reading community exchanges, sharing excellent reading content and insights to enhance reading experience. Of course, cultivating college students' deep reading abilities cannot be separated from teachers' dedicated guidance; universities should offer corresponding reading ability cul-

tivation courses to improve students' autonomous reading abilities for better mobile-based deep reading.

5.4 Utilize Information Push Platforms and Select Necessary "Metadata"

The advantage of mobile terminals (phones, iPads, Kindle readers, etc.) is portability, but their small screen sizes limit displayed text volume. Content delivered through information push platforms often needs condensation and 精华 extraction to attract readers. Academic journals play important roles in college students' professional learning and thesis writing, and most college students rely on academic journals when selecting deep reading content via mobile devices. As essential reading texts for deep reading, academic journals should consider their promotion direction based on readers' reading methods, using mobile terminal information push platforms to combine shallow and deep reading. Academic journals require deep reading, while mobile platform information belongs to shallow reading—they seem incompatible. However, readers can use shallow reading to comprehensively judge articles' topics and research directions. If valuable, they can then choose deep reading. Academic journals contain substantial "metadata" such as titles, abstracts, keywords, and classification numbers. During information push, necessary metadata that doesn't affect reading effectiveness should be selected to streamline text length and retain core viewpoints, attracting readers to deep reading. Meanwhile, deep reading hyperlinks or QR codes can be attached to shallow reading pages to achieve integration of shallow and deep reading for academic journals, improving readers' reading effectiveness.

5.5 Create Deep Reading Environments and Conduct Immersive Reading Activities

College students' main learning venues include classrooms, libraries, and study rooms—places with good reading environments and atmospheres most suitable for deep reading. As important extracurricular learning venues, university libraries should accelerate informatization processes, introducing new academic resources, retrieval technologies, and reading devices to meet college students' reading demands. They should also create high-value, personalized reading spaces and rich reading atmospheres to attract students. "Immersive reading" creates specific atmospheres where readers fully engage in reading situations without external information interference, achieving an immersive state for deep reading effectiveness [26]. Currently, many university libraries have launched immersive reading activities to enhance students' reading experiences. For example, on the centennial of the Communist Party of China, Shanghai Jiao Tong University Library launched an online and offline immersive Party history education platform integrating historical scenes with reading texts to stimulate participants' deeper understanding and reflection [27]. Some mobile terminals and apps have also introduced immersive reading modes—for instance, Kindle

e-readers have built-in immersive reading functions, and NetEase Snail Reading uses time-based payment to reduce ad interference and improve reading continuity and immersion.

This study conducted in-depth interviews with college students from different disciplines across four Chongqing universities regarding factors influencing mobile-based deep reading behavior. Using grounded theory for qualitative research, it constructed and analyzed a theoretical model of influencing factors. Results show that factors influencing college students' mobile deep reading include reading subject, reading text, reading cognition, terminal technology, and reading environment, which respectively play dominant, critical, supportive, guaranteed, and driving roles. Based on the influencing factor structure diagram, this study clarified the mechanism of each factor's influence to improve college students' reading abilities and effectiveness. However, due to limitations in interview time, research energy, and conditions, there may be deficiencies in interview sample representativeness and factor typicality, requiring further exploration in future research.

References

[1] Central People's Government of the People's Republic of China. The 18th National Survey Shows: Adult Citizens' Comprehensive Reading Rate Reaches 81.3% [EB/OL]. [2021-06-30]. http://www.gov.cn/xinwen/2021-04/23/content_{5601693}.htm.

[2] Guangming Daily. The 17th National Survey Report Shows: Audio Reading Becomes a New Growth Point for National Reading [EB/OL]. [2021-06-30]. http://news.gmw.cn/2020-04/21/content_{33755306}.htm.

[3] Hu Chunchun, Zhou Xueying, Guan Lishan, et al. Analysis of the Impact of Digital Reading on College Students Under New Media Environment [J]. Economic Research Guide, 2020, 4(18): 138-140.

[4] BIRKERTS S. The Gutenberg elegies: the fate of reading in an electronic age[M]. Farrar, Straus and Giroux, 2006.

[5] Liu Tingting. Analysis and Practice of Characteristics of Shallow Reading Extension "Deep" [J]. Library Construction, 2017, 4(12): 80-84.

[6] Ling Zunbin, Zhang Xinxin. Deep Reading and Shallow Reading in the Digital Publishing Era [J]. Science-Technology & Publication, 2011, 4(11): 68-70.

[7] Zhou Ya. Definition and Related Analysis of "Shallow Reading" Concept [J]. Library Journal, 2013, 32(8): 18-22.

[8] Zhang Qi. Analysis of "Deep Reading" in the Digital Age [J]. China Publishing Journal, 2017(5): 29-32.

[9] Ou Jihua, Li Kesheng, Luo Zichu. Research Progress on Reading Motivation [J]. Library, 2015(12): 36-45.

[10] Wu Yao. Research on Digital Reading from the Perspective of Media Ecology [D]. Wuhan: Huazhong University of Science and Technology, 2016.

[11] Wang Jian, Chen Lin. Network Reading from the Perspective of Compensatory Media Theory [J]. Library Theory and Practice, 2009(11): 42-44.

[12] BOLD M R, WAGSSTAFF K L. Marginalia in the digital age: are digital reading devices meeting the needs of today's readers?[J]. Library & information science research, 2017, 39(1): 16-22.

[13] WAXLER R P, HALL M P. Transforming literacy: changing lives through reading and writing: changing lives through reading and writing[M]. Bingley: Emerald, 2011.

[14] Li Guihua. Deep Reading: Concept Construction and Path Exploration [J]. Journal of Library Science in China, 2016, 4(12): 80-84.

[15] Wu Qiong, Zhang Yue. Gamification Framework for Social Reading Literacy Cultivation Under Metacognitive Theory [J]. Library Science Research & Work, 2016(1): 71-75.

[16] Li Fanjie, Li Guihua. Controversies and Reflections on "Deep Reading" [J]. Journal of the National Library of China, 2017, 26(6): 16-25.

[17] Qiu Xiangbin, Shen Shusheng, Xu Xiaola. Analysis of the Impact of "Shallow Reading" on "Deep Reading" in Mobile Network Environment—Based on Empirical Research of College Students in Zhejiang [J]. Library Science Research & Work, 2016(1): 71-75.

[18] Xu Ya. Research on Influencing Factors of Contemporary College Students' Mobile Deep Reading Behavior [D]. Wuhan: Huazhong University of Science and Technology, 2019.

[19] Yu Honglei. Research on College Students' Mobile Reading Motivation: Taking Nanjing as an Example [J]. Jiangsu Open University Journal, 2015, 26(6): 23-26.

[20] Wu Jian, Li Ziyun, Wang Hongmei. Analysis of Deep Reading Research Hotspots Based on Keyword Co-occurrence Clustering [J]. Library Construction, 2016(12): 53-59.

[21] Chai Yangli. Empirical Research on the Impact of Social Annotation on College Students' Digital Deep Reading [J]. Modern Distance Education Research, 2016, 4(2): 107-112.

[22] STRAUSS A, CORBIN J. Grounded theory in practice[M]. Sage, 1997.

[23] Chen Xiangming. Qualitative Research Methods and Social Science Research[M]. Beijing: Educational Science Publishing House, 2000: 328-335.

[24] Wu Yi, Wu Gang, Ma Songge. Review of the Origin, Schools, and Application Methods of Grounded Theory—Based on Case Analysis of Workplace Learning [J]. Distance Education Journal, 2016, 35(3): 38-50.

[25] Li Jingguang. Empirical Research on College Students' Information Literacy Assessment for Student Success [J]. Library and Information Service, 2016, 60(23): 46-54.

[26] Bai Lu, Guo Baohua. Enlightenment of Reading Variety Shows for Public Libraries to Conduct Immersive Reading Activities [J]. Library Research & Work, 2019(5): 60-63.

[27] Guangming Daily: Shanghai Jiao Tong University Library Creates Online and Offline Immersive Party History Learning Platform [EB/OL]. [2021-04-23]. https://news.sjtu.edu.cn/mtjj/20210312/143149.html.

Abstract: [Purpose/significance] To explore the influencing factors and action mechanisms of college students' deep reading behavior to improve their deep reading ability and reading effectiveness. [Method/process] After conducting one-on-one in-depth interviews with 28 college students from 4 universities in Chongqing, grounded theory was applied to conduct substantive coding of the interview content, deeply studying the influencing factors of college students' deep reading behavior based on mobile terminals, and exploring and constructing its grounded theory framework. [Result/conclusion] The research shows that reading subject, reading text, reading cognition, terminal technology, and reading environment are the five main categories affecting college students' deep reading behavior based on mobile terminals, which are dominant, critical, supportive, guaranteed, and driving factors respectively. On this basis, feasible ways to improve college students' deep reading ability are explored.

Keywords: grounded theory; mobile terminal; deep reading; influencing factors; college students

Note: Figure translations are in progress. See original paper for figures.