

A Study on the Causes of Attention Lapses in College Students' Online Learning

—Qualitative Analysis based on Grounded Theory

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Abstract: The development of digital technology provides the conditions for college students' online learning, and the attention lapses has become one of the core factors affecting the effect of online learning activities. Through qualitative interviews, it is found that college students are negatively affected by internal and external factors in online learning. The paper finds out the shortcomings of current online teaching, and puts forward corresponding suggestions for promoting the online and offline blended teaching mode in this digital age.

Keywords: Online Learning; attention lapses; Grounded Theory; Qualitative Analysis

1. Introduction

Nowadays, online learning has gradually become one of the mainstream learning methods. A common problem in college students' online learning is the attention lapses. It refers to the behavior of college students in the process of mobile learning, which is interfered by factors unrelated to learning or due to their own reasons, causing them to shift their attention to other things and stop their learning^[1]. Studies have proved that attention lapses is an important factor affecting the quality and effect of students' mobile learning .

2. Literature Review

2.1 Definition of Attention

“Attention” is a psychological concept, part of the cognitive process. According to the definition of psychology, “Attention is the orientation and concentration of mental activity or consciousness to a certain object.”. Directivity and concentration are two characteristics of attention. The types of attention include selective attention, persistent attention and distributive attention. The persistence of attention is also called the stability of attention, which is an important indicator to measure the quality of a person's attention.

2.2 Study on the theory and law of attention

The famous Yerkes-Dodson Law finds that attention and stimulus levels show an inverted U-shaped curve. Many studies focus on the use of attention theory in classroom teaching. From the perspective of research, it involves multiple teaching stages such as primary school, junior high school, senior high school, vocational school and university in the vertical direction, and involves multiple subject categories in the horizontal direction.

2.3 Study on learners' attention

Researchers have studied the characteristics and influencing factors of learners' attention. Seitlinger et al. found that learners' learning engagement is closely related to their attention in classroom learning^[2]. Bolkan et al. believe that learners' learning motivation directly affects the degree of attention^[3]. Hagenauer et al. found that teachers' positive emotions and good interaction between teachers and students can promote students' concentration^[4]. Besides, researchers Karst and others believe that there is a significant correlation between classroom size, classroom atmosphere and learners' classroom attention^[5]. Allison et al. found that teaching time is an important factor affecting students' classroom attention^[6].

2.4 Study on causes and intervention of attention lapses

Domestic and foreign scholars investigate the factors of students' attention distraction, mainly considering two factors: one is endogenous factors, including the characteristics of adolescent attention development, learning goals, learning states, interests and hobbies^[7]; The other is exogenous factors, including subject characteristics, learning environment, teacher factors and family environment. The intervention research on attention loss mainly focuses on the teachers, modern teaching equipment and students.

3. Research design and process

3.1 Research methods and tools

In this paper, qualitative research methods are adopted to conduct in-depth interviews with college students in natural situations to collect the respondents' real experiences and feelings in online learning. Based on the basic principles of grounded theory, NVivo11, a qualitative analysis tool, was used to conduct open encoding, axial encoding and core encoding of the original interview data.

3.2 Research objects and samples

This study takes college students as the research object, and the selection process of the interviewees strictly follows two criteria: the interviewees must have online learning experience, and have the problem of attention lapses in online learning. When reaching the state of "theoretical saturation" of qualitative research, the number of research samples was 13 (see Table 1).

Table 1. Demographic information of respondents (n=13 in formal interview)

Basic Information	Options	Number of People	Basic Information	Options	Number of People
Gender	Male	3	Grade	Grade 1 master	12
	Female	10		Grade 2 master	1
Major	Liberal arts major	4	Age	20~25 years old	11
	Science major	9		26~30 years old	2

3.3 Research process

The qualitative research includes three types: teacher-student interview, peer interview and focus group interview. Then, based on the Grounded Theory, the original materials were encoded at three levels. The main process steps are as follows:

3.3.1 Interview

The method of semi-structured interview was used. The interview activities mainly adopt the form of face-to-face interview. The interview outline was designed to focus on three questions: "Have you ever experienced a loss of focus during online learning?" "Give an example of your own inattention." "What is the cause of your loss of focus while studying online?" "What other factors do you think might affect your concentration while studying online?"

Under the guidance of the interview outline, conduct in-depth communication with the interviewed college students. On the one hand, respondents were asked to recall and describe in detail the learning experience about the loss of attention in online learning; On the other hand, in the interview process, according to the answers of the interviewees, appropriate guidance and follow-up on relevant questions are carried out. The whole interview process was recorded to ensure the accuracy and completeness of the interview data, which was convenient for later sorting.

3.3.2 Coding

After the interview, the interview documents were sorted out and the recordings were transcribed into words. Then the interview data were imported into the "internal materials" of NVivo11 software, and the original text data was encoded at three levels.

First, Open Coding is carried out. The original data are decomposed, and the similar phenomena in the text are given a localized name according to the definition, that is, the interview text is classified semantically. The author continued to decompose, compare, conceptualize and categorize the interview text until all the text coding was completed.

Next comes the Axial Coding. Since nodes formed by open coding are often isolated from each other, it is necessary to associate classes. This stage is mainly to establish the interrelation between concepts and concepts and between concepts and categories, encode the main axis category to grasp the cause and vein of the development of events.

Finally, Core Coding is performed to discover and clarify core categories. Core categories occupy a central position in all categories and are relatively stable phenomena that frequently appear in data. By means of exploration and coding, a general node is further established to ensure that the category of the core node is easily related to other categories.

3.3.3 Coding reliability test

The coding reliability test in this study is mainly conducted in two ways. Firstly, the “Coding Consistency Percentage” was used to measure the degree of coding consistency of the original materials. In addition, the “Coding Comparison” function of NVivo was used to compare the text materials encoded independently by the two researchers, and the result showed that the coding consistency percentage was between 83.71% and 98.81%. After the coding, we contacted the interviewees again, and 10 interviewees agreed to judge the coverage of their own experiences and situations by coding, and all of them said that the coding results reflected their real situations and feelings.

4. Results and analysis

4.1 Frequency analysis

The word frequency analysis program is compiled using Python7.0, the jieba thesaurus is used for word segmentation, and all entries are read one by one, only the contents closely related to the research topic are reserved. Words that are closely related to the topic but not recognized by the jieba word segmentation program are added to the user thesaurus. In the end, 101 related words were separated. The high-frequency words reveal the relevant words that respondents repeatedly mentioned, including teachers (417), courses (168), environment (56), mobile phone (113), etc.

4.2 Coding analysis

This study follows the principle of “local concepts”, which are integrated into 21 free nodes. In the secondary spindle coding, we

Table 2. Three-level coding and Node distribution of “college students’ attention lapses in Online Learning” (Part)

Core Coding	Axial Coding	Open Coding	Reference Nodes	
Teachers’ Teaching Style and Teaching Form	Teaching Style	Teachers operate concisely.	8	
		Teachers combine their lectures with life and specific situations.	22	
		The teacher is good at assigning class tasks.	15	
		The teacher’s teaching style is not dull.	17	
		Teachers have divergent thinking.	9	
	Teaching Form	Only with PPT.	34	
Content Quality and Duration Setting of Course Resources	Content	Dialogues and interaction.	23	
		The curriculum is too theoretical.	7	
		The content of the course is not attractive.	17	
Class Environment	Duration	The course duration is too long.	28	
	Quality	Whether the course is useful or not.	32	
	Other Classes	The previous class affects the next class.	6	
	Online Functions and Requirements	Barrage has an impact on the class.	17	
	Emergencies	Whether the class has cameras on.	25	
	Physical Environment	Urgent matters disturb the class.	8	
Learners’ Physiological Characteristics	Peer Influence	Class environment: dormitory or laboratory.	18	
		Roommates’ behavior affects individual focus.	5	
		Personal thinking is divergent.	20	
Time-space Separation between Teachers and Students	Learning Status	There is a golden age of concentration.	14	
		Teacher-student Emotional Connection	The relationship between teachers and students is weak.	5
		Teacher-student Action Interaction	The interaction behavior and movement habits of teachers and students are reduced.	22

examine the relationship between nodes, and establish the relationship between nodes, forming 5 meaning classes. In the three-level core coding, we systematically analyze the concepts formed by the main axis coding, and select the more dominant and explanatory core categories(see Table 2).

5. Discussion

Based on real interview materials, this study reveals the essence and the underlying reasons of college students' attention lapses in online learning. It is found that the combined effects of five internal and external factors affect the concentration and dispersion of college students' attention in online learning, and the reason model is shown in Figure 1.

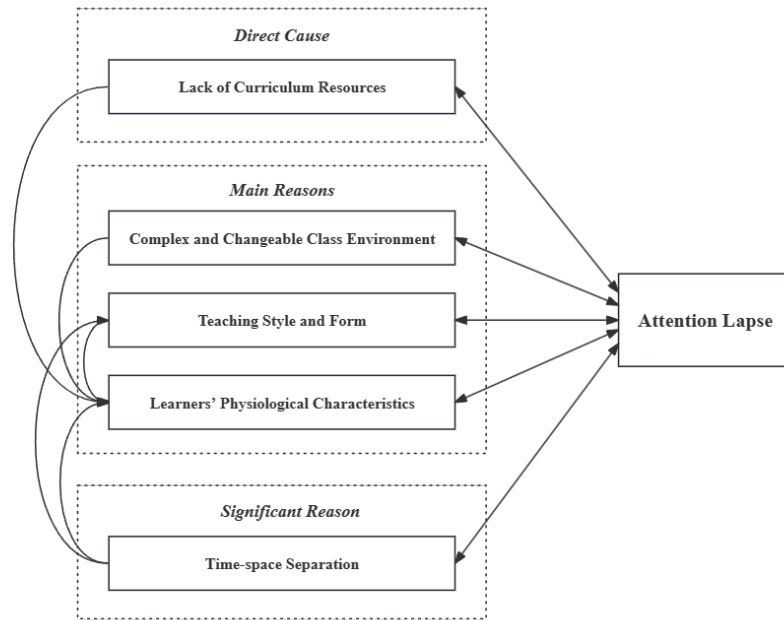


Figure1. Cause model of “college students’ attention lapses in online learning”

5.1 Lack of curriculum resources is the direct cause

From the original interview text and coding results, we find that if the content quality of online learning resources is not high and the course duration is not reasonable, it will directly affect the learning interest, learning continuity and learning enthusiasm of college students in online learning. The deficiency of resource content is not only reflected in knowledge content, but also in the media and content structure of resource presentation.

5.2 Dull teaching style, complex and changeable class environment and insurmountable physiological characteristics are the main reason

Teachers who only teach PPTs, do not engage in interaction, and do not link the teaching content to specific situations and real-life situations can dampen learners' learning enthusiasm. The changing physical learning environment is also the core factor that easily causes learners to lose focus in online learning. The insuperable physiological characteristic is the internal reason that makes it difficult for college students to focus their attention in online learning.

5.3 The time-space separation between teachers and students is a significant reason

The weakening of the connection between teachers and students leads to the decrease of learners' concentration. In the application of online platforms, the interaction between teachers and students is mostly in the barrage and comment area on the application platform, resulting in asynchronous interaction. The asynchronous communication between teachers and students cannot better promote the discussion

between teachers and students, resulting in students unable to get timely help when they encounter problems.

6. Revelation and Conclusion

The above conclusions have important implications for the improvement of college students' online learning attention, as well as the intervention and optimization of online learning effects.

First, optimize the design and development of online learning resources. One is to strengthen the internal logic design of online learning resources. The second is to strengthen the interactive and interesting design of online learning resources, such as embedded prompts, embedded questions and answers or other forms of interesting interactive forms. The third is to strengthen the structured design of knowledge and appropriate media design, such as presenting knowledge points in structured form, minimizing the multimedia elements unrelated to the course content, etc. Fourth, the resource design should be as short and concise as possible to facilitate learners' understanding and memory^[8].

Second, teachers should enhance digital teaching ability to promote learners' deep learning. Online teachers need to design moderately challenging learning tasks and use process evaluation to guide students to participate in the whole process^[9]. In addition, to explore the task type, project type, group learning mode, give full play to students' subjectivity; Through mutual evaluation, students can think deeply, and help students construct meaning through continuous communication and reflection, so as to realize the establishment of self-efficacy and accomplishment in online learning.

Third, strengthen teachers' guidance and support for college students' online learning. The first is to strengthen teachers' support for learners' online learning activities, such as setting up some task-driven and learning evaluation links in online learning. The second is to provide learners with online learning paths and teacher support to promote learners' learning transfer, such as providing high-quality online learning platforms and resources, giving some learning guidance and learning strategies; The third is to cultivate a learning community and guide college students to form learning groups that cooperate and supervise each other, such as online learning groups formed through various learning platforms and educational apps^[10].

7. Reflections of researchers

In this study, the original text was obtained through purpose sampling and in-depth interview. Although the samples reached the "theoretical saturation" of qualitative research, such saturation is only an ideal state, because the number of interviewees and source constraints cannot guarantee complete saturation of nodes.

In addition, the research object is the whole college students, and the classification sampling of the interviewed college students needs to be further refined and improved. Future studies will further refine the sampling classification of college students, increase the number of respondents, and conduct more in-depth empirical researches on the problem of out-of-focus attention in college students' online learning.

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