



Research on Students' Addictive Online Behavior Based on the Fogg Behavior Model Analysis of Online Courses

Cheng Huang

Hainan Normal University, Haikou, 571158, China

414409864@qq.com

Abstract. With the widespread adoption of the internet in students' academic lives, while digital platforms have brought significant convenience, addictive online behaviors have caused various issues in learning and social relationships for some students. Currently, addictive online behaviors have become a focal point of domestic and international attention. The pervasive use of smartphones in students' daily lives has created a certain degree of concealment for such behaviors. This study decomposes and extracts online learning behaviors during classroom teaching in online courses, identifying high-probability learning behaviors in online education. Through data collection and analysis on online course platforms, it screens out individual learners exhibiting abnormal online behaviors. Utilizing the monitoring functions of electronic classroom systems, the study collects behavioral data from these learners. Through data analysis and interviews, it preliminarily identifies students with addictive online behaviors, providing references for potential internet addiction detection and guidance in the future.

Keywords: Fogg behavior model, online courses, addictive online behaviors, motivation

1 Introduction

The widespread application of computer networks in the field of education has brought many conveniences to students' learning and living. However, excessive addictive internet usage has seriously affected students' learning, living, and social relationships. At the same time, the popularity of smartphones in students' learning and living has made addictive internet usage more concealed and harder to monitor. Currently, in the field of school education, online activities such as playing online games, watching online videos and animations, and engaging in online chatting through social media are prevalent among students. Appropriate and moderate online activities such as playing online games, watching online videos and animations, and engaging in online chatting through social media have limited impact on students' learning, living, and social relationships. However, addictive internet usage can have a significant negative impact on individual students' learning, living, and social relationships.

© The Author(s) 2026

A. Y. M. A. Islam et al. (eds.), *Proceedings of the 2025 International Conference on Educational Technology and Management Information Systems (ETMIS 2025)*, Advances in Computer Science Research 129,

https://doi.org/10.2991/978-94-6239-630-2_56

Previous literature research has indicated that addictive internet usage can negatively impact students' cognition, including perception and memory, as well as their psychological and behavioral aspects. Simultaneously, students who engage in addictive internet usage exhibit strong tendencies and motivations towards internet usage, leading to addiction. From a behavioral science perspective, this paper constructs an analysis model for students' addictive internet usage based on the Fogg Behavior Model for online courses. By collecting and analyzing data on explicit internet usage behaviors in online classroom teaching, this study initially identifies individual students exhibiting addictive internet usage behaviors. This provides valuable reference for subsequent internet addiction detection and related guidance and assistance. Currently, internet addiction detection primarily relies on medical tests and psychological scales. This study adopts a video monitoring approach combined with a structured interview method based on the Fogg Behavior Model to analyze addictive internet usage behaviors, which introduces certain limitations in the confirmation of internet addiction. However, for ordinary students, medical tests and scale assessments have certain practical limitations in real-world applications. From a behavioral science perspective, collecting and analyzing students' explicit internet usage behaviors undoubtedly offers new approaches and methods for the initial screening and tracking of internet addiction behaviors among adolescents.

2 The Connotation of Fogg's Behavior Model

The Fogg Behavior Model, proposed by B.J. Fogg, a behavioral scientist from Stanford University in the United States, is a behavioral design model. The Fogg Behavior Model posits that the occurrence of individual human behavior requires the simultaneous satisfaction of three core elements: motivation, ability, and trigger. Only when an individual simultaneously satisfies the elements of motivation and ability can the trigger effectively prompt the occurrence of individual behavior. That is, $B=M \times A \times T$, where B represents the behavior that occurs, M represents motivation, A represents ability, and T represents trigger conditions. B.J. Fogg believes that the sources of individual human motivation M mainly fall into three categories: first, the pursuit of pleasure and avoidance of pain; second, the pursuit of hope and avoidance of fear; third, the pursuit of recognition and avoidance of rejection. At the same time, motivation exhibits a certain degree of volatility. Ability A represents the ability required for an individual to complete a behavior and serves as the intrinsic condition foundation that promotes the occurrence of behavior. Trigger conditions T are signals that prompt the occurrence of individual behavior and indicate under what circumstances individual behavior will occur. Under conditions of high motivation, if an individual's ability level is also high, appropriate signal triggers will manifest as high-probability behavior occurrence events. Conversely, under conditions of low motivation and low ability level, the occurrence rate of behavior is low, representing low-probability behavior. The Fogg Behavior Model illustrates that individual human behavior can be cultivated through later training, and through the setting of certain conditions, the occurrence of individual human behavior can be made operable and

cultivable. Currently, the Fogg Behavior Model is widely applied in the formation and training of individual human habits, product design, health management, behavioral research, team behavior building, and other fields. In the field of education, the Fogg Behavior Model has positive significance for cultivating students' behavioral habits, detecting students' explicit behavioral dynamics, and providing timely guidance and assistance.

3 Students' Addictive Internet Usage Behavior and its Impact on Their Learning and Life

Abnormal online behavior among students refers to behaviors exhibited by students when using the Internet that deviate from the intended purpose, exceed the normal scope, and have a significant negative impact on their social function or psychological state. Abnormal online behavior among students is characterized by loss of control, psychological and emotional dependence, and impaired social function.^[2] Abnormal online behavior among students manifests in various forms, and this article primarily focuses on the common addictive online behaviors exhibited by students during their online usage. According to domestic and international research, addictive online behaviors among students mainly manifest as addictions to online gaming, online video and animation, and online interpersonal relationships.

3.1 Overview of Domestic and International Research on Addictive Internet Use Behavior

Since the emergence and popularization of computer networks, people have begun to pay attention to the abnormal behaviors and mental health issues associated with addictive internet use, as well as the negative impact it has on students' learning and life. With the deepening of research on addictive internet use behaviors, many behavioral scientists suggest defining the state of "addiction" from a behavioral perspective, arguing that the core element of addiction may be "impaired control over a behavior." They also emphasize the need to pay more attention to the adverse effects of addictive internet behaviors on individual learning and life. Behavioral science has introduced the concept of behavioral addiction. Although the mechanism of behavioral addiction is not yet clear, people may develop strong motivations for addictive internet use, unconsciously becoming addicted to their internet activities during the process of using the internet.

3.2 The Impact of Addictive Internet Usage Behavior on Students' Learning and Life

Some educational scholars both domestically and internationally are currently paying close attention to the impact of students' addictive internet use on their attention, memory, social relationships, and other aspects of learning and social relations. According to two survey reports for teachers from two prestigious research institutions

in the U.S.A, teachers generally believe that students' addictive internet use can hinder their attention, memory, and social relationships. Meanwhile, Vicki Ryderot, a researcher who has been engaged in this research for a long time, pointed out that the rapid increase in students' time spent on computer networks has led to an average of twice as much time spent with screens each year as they spend in class. Addictive internet use, due to excessive internet usage, has led to widespread problems in students' learning and social relationships. At the same time, school teachers generally believe that students' addictive internet use requires them to work twice as hard in teaching to capture students' perception and attention.

4 An Analysis Model of Students' Addictive Online Behavior Based on the Fogg Behavior Model of Online Courses

4.1 Extraction of Online Usage Behavior in Online Course Teaching

Online courses are a teaching format conducted in a network environment. In the online course environment, students often exhibit two different types of online usage intentions and behaviors. ^[3]One is the online usage behavior aimed at online course learning. The online usage behavior of these students will be arranged according to the teaching tasks of the teacher, and the corresponding online usage behavior will be recorded by the online platform and used for teaching monitoring and evaluation of online courses. The other is a small group of students with a tendency towards internet addiction. Due to their strong tendency towards addictive online behaviors, their online usage during online course learning is mainly focused on online games, browsing online videos and anime, and online interpersonal relationships. This article uses the online course platform of "Modern Educational Technology" in our school as the main carrier for data collection, and adopts the course platform to record data and the Extreme Domain electronic classroom to collect data on the two types of online usage behaviors. Through data analysis, students with a tendency towards addictive online usage behaviors are screened out.

Online Course Usage Behavior Data on the Internet.

During the online course learning process, students' online usage behaviors exhibit various manifestations. Early analysis of online course usage behaviors mainly focused on students' dwell time on resource pages, learning behaviors such as completing exercises and quizzes, and various explicit online usage behaviors when students interacted with webpage text. Recently, with the development of artificial intelligence technology and its application in online education, the data collection and processing of students' learning behaviors in online courses have evolved towards multimodal analysis, encompassing learning path, emotional state, students' focus on learning content, body movement trajectory, facial expression, and eye-tracking technology. This paper relies on the ongoing "Modern Educational Technology" online course at our university to collect data on online usage behaviors. The "Modern Educational Technology" course is a national first-class online course at our university aimed at

cultivating the educational technology application abilities of teacher education students. Through the data recording function of the course teaching platform, eight types of online usage behaviors in students' online course learning are collected, namely, online course login, micro-video learning, chapter exercises, quizzes, student-student interaction, teacher-student interaction, use of learning platform tools, and learning summary and sharing.

Addictive Internet Usage Behavior Data.

The data collection of addictive internet usage behavior is based on the analysis of online learning usage behavior data recorded by online course platforms. After soliciting opinions from all students, the monitoring function of Extreme Domain Electronic Classroom is employed to track and collect the internet usage behavior of individual students who exhibit abnormal learning behaviors in online course learning. The data collection targets students' internet gaming behavior, internet video and animation viewing behavior, and online interpersonal behavior.

4.2 Analysis of Fogg Behavior Model Parameters for Online Course Network Usage Behavior

Based on the construction characteristics of the online course "Modern Educational Technology", this article quantifies the eight types of online learning usage behaviors that can be recorded in the online course platform using the Fogg Behavior Model analysis method. The quantified motivation level M value and ability level A value are obtained through a questionnaire survey of 198 students, and the average value of the valid questionnaires is taken. The trigger data T value is quantified by collecting the occurrence rate and completion rate of student behaviors after teachers assign tasks to complete learning behaviors, using the calculation formula: Trigger = Occurrence Rate * Completion Rate * 10. The M, A, and T values are all between 0 and 10. Table 1 below presents the Fogg Behavior Model parameter data:

Table 1. Online course Fogg student learning behavior parameter quantification table

learning behavior	Motivation M-value	Ability A value	Trigger T value	Behavior occurrence B value	B-value sorting
Course login	10	10	9.8	980	1
micro-video learning	9.5	9.7	8.8	810.92	2
Chapter Exercises	8.7	9.2	8.6	688.34	3
quiz	8.2	8.6	7.6	535.95	4
teacher-student interaction	6.1	8.8	4.3	230.82	7
student-student interaction	7.7	8.8	6.4	433.66	5
Use of learning platform tools	7.3	7.1	7	362.81	6
Learning summary and sharing	6.3	7	5.2	229.32	8

4.3 Construction of an Online Course on Analyzing Student Addictive Internet Use Based on the Fogg Behavior Model

Analysis of Fogg Behavior Model Parameters for Online Course Usage Behavior.

Based on the characteristics of the online courses studied, this paper categorizes the B value into three levels: low-probability behavior ($0 \leq B < 300$), medium-probability behavior ($300 \leq B < 500$), and high-probability behavior ($B \geq 500$). The above data statistics indicate that:

- I. Course login behavior, micro-video learning behavior, chapter exercise learning behavior, and quiz learning behavior are learning behaviors that occur with high probability, and students' ability level, motivation level, and trigger value are all high.
- II. The behaviors of peer-to-peer interactive learning and the use of learning platform tools belong to learning behaviors with a medium probability of occurrence, where students' ability level, motivation level, and trigger value are relatively high.
- III. Teacher-student interactive learning behaviors and learning summary and sharing behaviors are learning behaviors that occur with low probability. Both the learning action level and information triggering data for these two types of learning behaviors are relatively low.

Construction of an Online Course on Analyzing Student Addiction to Internet Use Based on the Fogg Behavior Model.

Due to the needs of research objectives, it is necessary to extract online course learning behaviors. This paper extracts four types of online learning behaviors that occur with medium to high probability in online course teaching: micro-video learning, chapter exercises, student-student interaction, and use of learning platform tools. Under normal course teaching conditions, these four types of online behaviors occur with a high probability.^[4] Course login is an inevitable behavior for students who are present in class, while teacher-student interaction and learning summary and sharing behaviors occur with a low probability. Quiz learning behaviors are periodic learning behaviors that do not occur in every class. Therefore, course login, teacher-student interaction behaviors, learning summary and learning behaviors, and quiz learning behaviors are not included in the scope of data statistics and analysis. The student addiction network usage analysis model constructed in this paper's online course Fogg behavior model is shown in Figure 1:

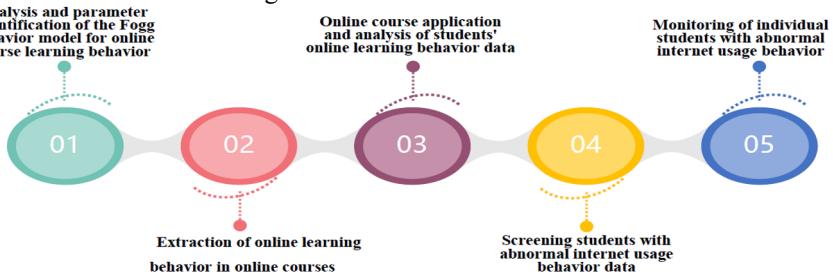


Fig. 1. Online course: Analysis of Fogg Behavior Model and Addictive Internet Use Analysis Model for Students

5 Application of a Student Addictive Internet Use Analysis Model Based on the Fogg Behavior Model Analysis of Online Courses

5.1 Application Design of Addictive Internet Use Analysis Model

Relying on our school's "Modern Educational Technology" online course platform combined with the Extreme Domain electronic classroom system, we collected and analyzed network usage behavior data from 487 students across 5 teaching classes. The analysis of online course platform network learning behavior data is used to screen students with abnormal online learning behaviors. The data collection of the online course platform only includes data from classroom teaching time, and extra-curricular online course data is not included in the scope of data collection. The Extreme Domain electronic classroom is used for monitoring the selected students with abnormal online learning behaviors and collecting their on-site network behavior data during the course. The data collection period is 3 months, with 12 classroom teaching sessions, totaling 24 class hours. The first two months, with 8 sessions and 16 class hours, are used for collecting and analyzing online course platform network learning usage behavior data. Through data analysis of the 8 sessions, all abnormal students who did not complete the classroom network learning behavior tasks in all 8 sessions were screened out. The last month, with 4 classroom teaching sessions, the Extreme Domain electronic classroom system is used to monitor and observe the selected abnormal learning individuals, recording their on-site network usage behavior during the class.

5.2 Data Collection and Analysis for the Application of an Addictive Internet Use Analysis Model

The "Modern Educational Technology" course employs a blended teaching approach, where classroom instruction is driven by learning tasks, breaking down the course activities into a sequence of learning behaviors that students are required to complete through online courses. These include completing a certain number of micro-video viewings, chapter exercises, engaging in peer interaction and communication, and utilizing online course platform tools. Based on the recorded data from the online course platform, students who failed to complete the learning behavior tasks even after eight attempts over a two-month period are identified. The data collected from these eight online course classroom sessions is presented in Table 2:

Table 2. Data Table of Student Completion of Learning Behavior Tasks in Eight Online Courses

learning behavior	The number of learning behavior tasks that should be completed	Number of students	The number of students who have not completed their learning behavior tasks	The rate of uncompleted learning behavior tasks
micro-video learning	8	487	46	9%
Chapter Exercises	8	487	78	16%
student-student interaction	8	487	173	36%
Using learning platform tools	8	487	72	15%

Based on the data recorded by the above platform, a total of 46 individual students were identified who had not completed any learning activities. These 46 students failed to complete all 8 classroom teaching tasks. Apart from 24 instances where they did not log in through the course registration system during the 8 classroom sessions, the remaining 46 students logged in and spent the same amount of time online as their classmates, which was during the actual classroom teaching time.

In the following month, the monitoring function of the Jiyu electronic classroom system was used in four classes to monitor 46 students, primarily focusing on their addictive online behaviors. The monitoring method involved sampling and monitoring three times during the class, namely before, during, and after the online learning tasks assigned by the teacher. The monitoring lasted for half a minute and recorded their online behaviors. The data from the four monitoring sessions for the 46 students is presented in Table 3: (Note: The term "addictive online behaviors" in the table refers to addictive behaviors related to online gaming, browsing online videos and animations, and online social interactions.)

Table 3. Data Table for Monitoring Addictive Online Usage Behavior in Extreme Domain Electronic Classroom System

Class Number	Monitor the total number of students	Number of individuals exhibiting internet addiction behavior at the former monitoring point	Number of individuals exhibiting internet addiction behavior at the intermediate monitoring point	Number of individuals exhibiting internet addiction behavior at the post-monitoring point	Addiction to internet behavior rate
The first class	43	42	41	43	97.7%
the second class	40	39	39	38	96.7%
The third class	42	38	42	39	94.4%
the fourth class	38	37	37	36	96.5%

The above data indicates that among 46 students in an online learning environment, except for 2 students who were absent from 4 classes, 44 students' online usage behaviors during the monitoring period were primarily online gaming, watching online videos, or engaging in online social interactions, with a high rate of internet addiction behavior reaching 96.3%. To further understand the views of the 46 research subjects on addictive behaviors, this paper utilizes the Fogg Behavior Model analysis method to investigate the action, ability level, and trigger level of internet addiction among the 46 research subjects through questionnaires. The questionnaire mainly includes three questions: First, what is your motivation level for using online gaming, watching online videos or anime, or engaging in online social interactions? The value ranges from 0 to 10; second, how difficult or easy is it for you to use online gaming, watching online videos or anime, or engaging in online social interactions? The value ranges from difficult to easy, from 0 to 10; third, what is the trigger level of external factors for your use of online gaming, watching online videos or anime, or engaging in online social interactions? For example, when entering an online usage environment, using a smartphone, or seeing a situation involving online usage, how strong is your desire for online gaming, watching online videos or anime, or engaging in online social interactions? The value ranges from difficult to easy, from 0 to 10. A total of 46 interviews were planned, and 38 were effective. The average values of the interview data from the 38 interviewees are $M=9.6$, $A=9.9$, and $T=9.5$. The B value for the occurrence of addictive online usage behavior is $B=M*A*T=902.88$. It can be seen that for this group of monitored students, in an online environment, the occurrence of addictive online behaviors is a high-probability online usage behavior, and they are basically the initial candidates for internet addiction.

5.3 Reflection on the Application of Analytical Models for Addictive Internet Use

The above data analysis indicates that:

I. Educational applications based on the Fogg Behavior Model analysis of online courses break down online course teaching activities into a system where students need to complete certain online course learning behaviors. By triggering appropriate teaching information, they can effectively promote the completion of online course teaching tasks and enhance the teaching quality of online courses.

II. In online course teaching, there are two common types of internet usage behaviors: one is the internet usage behavior related to online courses, and the other is addictive internet usage behavior driven by strong addictive motivations. By extracting high-probability behaviors in online courses and utilizing data collection and analysis from the platform, it is possible to identify individual students exhibiting abnormal internet usage behaviors in online course teaching.

III Based on the consent of students, software such as the electronic classroom system can be utilized to monitor and screen abnormal online behavior in real-time. Using the Fogg Behavior Model analysis method, an interview questionnaire is designed to confirm the addiction status of individual students exhibiting abnormal online behavior during online course instruction.

6 Conclusion

Online usage behaviors based on online interpersonal relationships such as online gaming, watching online videos and animations, or online chatting are prevalent among students. Appropriate and moderate online gaming, watching online videos and animations, or online chatting have limited impact on students' learning and social relationships. However, addictive online usage behaviors can have a significant impact on students' individual learning and social relationships. Due to the widespread use of smartphones in students' learning and daily lives, students' addictive online usage behaviors are somewhat concealed. Online courses are currently vigorously developed and utilized in various educational systems in China. Through data collection and analysis of classroom teaching in online courses, this paper applies an analysis model for students' addictive online usage based on the Fogg behavior model of online courses to initially screen students with addictive online usage behaviors. This can provide a certain reference value for subsequent further detection of internet addiction and provide relevant guidance and assistance. Currently, internet addiction detection primarily relies on medical testing and psychological scales.^[5] For ordinary students, these methods have certain limitations in practical use. This study adopts a video monitoring approach combined with a structured interview method based on the Fogg Behavior Model to analyze addictive internet usage behaviors for the initial screening and confirmation of internet addiction. Although this approach has certain limitations in confirming internet addiction, from the perspective of behavioral science research, the collection and analysis of students' explicit internet usage behaviors undoubtedly provide new ideas and methods for the initial screening and tracking of internet addiction behaviors among adolescents.

Acknowledgments

Grant Sponsor: General Project of Natural Science Foundation of Hainan Province, "Research on the Construction and Application of Online Usage Behavior Model for Internet Addiction Youth in Digital Learning Based on Fogg Behavior Model", Grant Number: Project number (621MS0772).

References

1. Giuliano Duarte Anselmi, Steven Michael Crane, Manuel Armayones Ruiz, Pablo Villalobos Dintrans. 2025. Behavioral science meets public health: a scoping review of the fogg behavior model in behavior change interventions. *BMC Public Health*, Volume 25, Issue 1. PP 3468-3468. from https://link.springer.com/article/10.1186/s12889-025-24525-y?utm_source=cnki&utm_medium=affiliate&utm_content=meta&utm_campaign=DDCN_1_GL01_metadata.
2. Yansen Theopilus, Abdullah Al Mahmud, Hilary Davis, Johanna Renny Octavia, Nadia Athalia. 2025. Parental Mediation, Online Behaviour and Internet Addiction Risk in Children: A Qualitative Diary Study of Parental Perspectives. *Human Behavior and Emerging*

- Technologies. Volume 2025 , Issue 1 .PP 8832647-8832647. DOI: 10.1155/HBE2/8832647.
3. John Cripps Clark, Michael L.Hoover.2025. Activity-Based Instructional Design for online teaching / Diseño Instruccional Basado en Actividades para la enseñanza en línea. Culture and Education. Volume 37, Issue 4. PP 912-945. from <https://sage.cnperreading.com/paragraph/article/?doi=10.1177/11356405251385341>.
 4. Zhang Xuefeng, Huang Yelin, Chen Mingshuang, Wang Fenglian.2024.Exploring the Factors Affecting College Students' Intention to Use Online Teaching Platforms Through an Extended Technology Acceptance Model.International Journal of Web-Based Learning and Teaching Technologies (IJWLTT). Volume 19, Issue 1.PP 1-16. DOI: 10.4018/IJWLTT.348656.
 5. Max Sannemalm, Nathalie Lybert, Lisa Gunnarsson, Per Andrén, Martin Kraepelien, Maria Bragesjö, Robin Fondberg, Volen Z. Ivanov, David Mataix Cols, Lorena Fernández de la Cruz, Erik Andersson, Christian Rück, Ekaterina Ivanova.2025.Study protocol for a parallel-group randomized controlled trial of internet-delivered behavior therapy for adults with Tourette syndrome.Frontiers in Digital Health. Volume 7, Issue. PP 1518666-1518666. DOI: 10.3389/FGTH.2025.1518666.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

