# Research on the factors influencing user stickiness of pan-knowledge videos - based on the Bilibili platform

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**Abstract:** The current post-epidemic era has seen a sharp increase in the popularity of pan-knowledge short videos. This study analyzes the factors influencing user stickiness of pan-knowledge short videos based on perceived value theory and technology acceptance model through a questionnaire survey of 252 users of Bilibili. It is found that the role of acquiring knowledge and relieving information anxiety provided by these short videos is the reason for attracting users to browse pan-knowledge short videos. At the level of the perceived value of pan-knowledge short videos, perceived information value, entertainment value, and emotional value all influence user stickiness. At the same time, user stickiness is also influenced by perceived ease of use and social influence.

**Keywords:** pan-knowledge short video, perceptual value, technology acceptance theory, user stickiness

## 1 Introduction

Since 2020, the national epidemic has been spreading at multiple points, and now in the post-epidemic era, the epidemic still has a significant impact on our society. Compared with traditional knowledge videos, pan-knowledge videos focus more on life skills, popular science knowledge, learning skills, and sharing experiences, which is an emerging type of video under fragmented usage scenarios. In the post-epidemic era, the popularity of pan-knowledge videos has risen. Platforms such as Bilibili, Today's Headline, Zhihu, Douyin, and Kuaishou support pan-knowledge short video content, making it a new windfall for the development of the short video industry. The popularity of pan-knowledge videos is the return of rational value after the aesthetic fatigue of entertaining videos, and also the reflection of people's pursuit of higher-level demand.

## 2 Literature Review

### 2.1 Pan-knowledge short videos

Pan-knowledge short videos have important social functions such as popularizing life and basic scientific knowledge. "Only what you can't think of, nothing you can't find" - short videos of pan-knowledge have a wide range of contents, and usually attract audiences to browse with raising questions, and more often use interesting language or metaphors to present knowledge, or adopt the form of animation, which makes knowledge from obscure and difficult to understand to easy to understand and accept.

On April 17, 2019, CCTV.com released "Do you know? This group of young people fall in love with Bilibili for learning", which made the learning platform attribute of Bilibili widely known[1]. On December 9, 2021, Bilibili released the "2021 Bilibili Creators Ecology Report"[2]. The data showed that compared to 2020, the scale of uploaders in the knowledge area of Bilibili grew by 92% in 2021, covering various professional fields such as biology, medicine, history, and literature, and the number of people learning at Bilibili exceeded 183 million. According to its 2022 financial report, in the second quarter, life, games, entertainment, animation, and knowledge became the top five most popular content categories for users on Bilibili.

The phenomenon of the rising popularity of pan-knowledge videos has already attracted research from multiple perspectives in academia. Scholars Zhang Jinglu and Duan Fengfeng analyzed the components and output results of pan-knowledge video interaction rituals under the paradigm of interaction ritual chain theory, and the study showed that collective symbols and secondary processing and dissemination are the manifestations of high interaction ritual intensity. In addition, it was found that pan-knowledge videos based on social hot topics would enhance the emotional resonance of the same group and play a role in enhancing the interaction rituals between uploaders and users, driven by the role of users' engagement [3]. Based on the theories of interactivity, externalization, and technical support, Tianru's literature discusses the users' behaviors of watching pan-knowledge videos, indicating that advanced Internet technology has brought more elemental features to online knowledge as well as the pan-knowledge knowledge field and that the current pan-knowledge video dissemination mode brings diverse learning methods to users but is prone to be superficial. Thus, the platform should cultivate users' systematic learning habits [4].

### 2.2 Perceived value theory

The concept of perceived value emerged in the 1980s, but so far there is no uniform definition. However, in general, perceived value has been mostly used to study the influence of value on users' purchasing behavior.

Sheth, Gross, and Newman proposed a five-dimensional model of user-perceived value, which considered that a product or service includes five aspects of value, namely, functional value, social value, cognitive value, situational value, and emotional value. In their study of the relationship between perceived value and satisfaction using "Today's headlines" as an example, scholars An-Hui Wang and Wu Li pointed out that using the PERVEL scale to measure perceived value, and they found that the emotional, social, and performance values of perceived value directly influenced satisfaction [5]. Regarding the relationship between user-perceived value and user loyalty, domestic and foreign scholars believe that user-perceived value directly or indirectly influences user loyalty. By empirically analyzing the research model of mobile news client user loyalty, Wang Junjia scholars concluded that both perceived profit elements of mobile news clients have a positive impact on user satisfaction and user loyalty [6]. A study by scholar Fan Enze of Imho University in Korea showed that perceived value function as the intermediary of short video interaction and consumer loyalty, which can significantly enhance consumer loyalty [7].

However, these studies have mainly investigated perceived value from a macro perspective and have not conducted an exploration of the impact of perceived value on pan-knowledge short videos, not answering the question about the impact of perceived value on user stickiness of pan-knowledge short videos.

### 2.3 Theory of Technology Acceptance Model (TAM)

The technology acceptance model was proposed in 1986 by Davis in his doctoral dissertation using the Theory of Reasoned Action (TRA, Theory of reasoned action) to explain users' behavior in receiving information, and it has received much attention from scholars at home and abroad, and more research results have been achieved[8]. The technology acceptance model (TAM) mainly includes perceived usefulness, perceived ease of use, attitude, behavioral intention, and usage behavior. Among them, perceived usefulness and perceived ease of use are the two most indispensable variables in the model, which affect users' attitudes and behavioral intentions toward the use of certain information technology.

As related research progresses, Davis points out that when applying TAM theory, it is important to consider many external variables that may have complex effects on endogenous variables and behavioral intentions. Venkatesh Davis, a foreign scholar, introduced variables such as social influence in 2000 and constructed an expanded technology acceptance model[9].

Since its establishment, TAM has been widely used to study users' behaviors in accepting various information technologies and systems, which are mainly divided into four domains: communication systems, conventional target systems, office systems, and professional business systems. Research by Sun and other scholars has shown that TAM2, which highlights the important role of direct experience in mediating the relationship between subjective norms and the perceived usefulness of new technologies, is a valid theoretical framework for scientific research issues regarding the use of new technologies during the transition to digital platforms

in the U.S. newspaper industry ( e. g., Legris, Ingham, & Collerette, 2003; Venkatesh & Davis, 2000) [10]. Based on technology acceptance theory, Peng Sihao scholars concluded that the perceived usefulness and perceived ease of use of health mobile short video users positively influenced information adoption by analyzing data on the characteristics and communication channels of health mobile short video communication subjects, such as Jitterbug[11].

### 2.4 User stickiness

In the field of traditional marketing, "stickiness" refers to the frequency of customer use, and the higher the stickiness of the customer, the higher the loyalty to the product, as scholar Nemao argues that stickiness is the ability to prevent customers from switching to competing companies through various ways, such as brand awareness, frequent buyer programs, and creating economic costs; while in the field of social sciences, Shim et al. suggests that the concept of "stickiness" in the social science sense refers to the ability of a company to retain users and drive them further to its website[12]. Later on, some scholars, such as Haiping Wang, argues that user stickiness is a cognitive and emotional base of users to a website that doe. s not change their preference for continued visits when faced with switching pressure or other factors[13].

The current research on "user stickiness" is divided into two categories: one is to explore user stickiness from the perspective of the website, for example, Paul believes that user stickiness is the ability of the website to retain consumers and make them return[14]. The other category is studied from the user's perspective, which considers user stickiness as the user's cognitive and emotional characteristics for the website and the user's willingness to use the Internet product continuously.

Chen Meiling took perceived usefulness and perceived ease of use as antecedent variables of college students' stickiness to online learning systems, and verified through empirical analysis that they have a positive impact on user stickiness through the mediating role of user satisfaction. Tian Tenglong discussed the influence of each value dimension of short video applications on user stickiness[15].

Through the above literature review, scholars' research on user stickiness has not focused on analyzing the pan-knowledge short video domain and has not been linked to the acceptance model in-depth.

### 2.5 Question formulation

In this paper, we will take the Bilibili platform as an example and try to answer the following questions from the perceived value theory and technology acceptance model.

What are the factors influencing the popularity of pan-knowledge videos among users? What are the motivations or needs of users to access short pan-knowledge videos?

## 3 Research Methodology

This paper uses the questionnaire method to try to answer the above questions.

H1:Perceived utility positively affects user stickiness

H1a: The perceived value of information positively affects user stickiness

H1b: Entertainment value perception positively affects user stickiness

H1c: Perceived emotional value positively affects user stickiness

H2: Perceived ease of use positively influences user stickiness

H3: Social influence positively affects user stickiness

H4: There are significant differences in user stickiness among users with different education levels

This paper uses Questionnaire Star to make the questionnaire, and the main contents of the questionnaire are following: (1) Basic information confirmation part: gender, age, and education level. (2) Screening part: to screen whether the respondents have watched pan-knowledge videos on Bilibili. If not, the questionnaire will be terminated. (3) Bilibili pan-knowledge video viewing: including type, frequency, and length. (4) Variable measurement: the variables of perceived value (information value, entertainment value, emotional value), social influence, and user stickiness are measured using a five-level Li Kot scale, including the following statements: Have you watched pan-knowledge videos on Bilibili? What types of pan-knowledge videos do you usually watch on the Bilibili? What is the length of time you usually watch pan-knowledge videos on Bilibili? What do I think is the usefulness of the knowledge I get from Bilibili's pan-knowledge videos? Whether do I think the knowledge I get from the general knowledge videos on the Bilibili meets my learning needs? Whether do I think this way makes learning knowledge easy and interesting? Whether do I think watching short videos of Bilibili's pan-knowledge category gives me a sense of accomplishment and satisfaction in learning knowledge? Is it easy for me to search for the general knowledge videos I want to watch on Bilibili? Whether do I think the general knowledge videos on Bilibili are easy to learn and understand? Do many people in my relationship circle (life circle, work circle, public circle) follow the account? Using the sampling method of judgmental sampling, questionnaires were distributed in WeChat friend circle, WeChat group, QQ, and other channels, and the questionnaire was executed on October 4, 2022.

## 4 Research Findings and Discussion Points

### 4.1 Description of sample characteristics

A total of 252 questionnaires were collected in this survey, among which 199 respondents had watched pan-knowledge videos in Bilibili, accounting for 79% of the overall respondents. Among the many pan-knowledge videos, the pan-knowledge videos of general knowledge are

the most popular among the respondents, and 75.88% of the respondents said they often watched the pan-knowledge videos of general knowledge in Bilibili. In addition, pan-knowledge videos on humanities, history, and natural science are also popular among users. In terms of browsing behavior, more than 60% of respondents have a low frequency of exposure to pan-knowledge videos, and more than 60% of respondents have less than 15 minutes of exposure to pan-knowledge videos.

### 4.2 Description of the results of structural analysis

In this questionnaire survey, the perceived value, perceived ease of use, social influence, and user stickiness variables are measured by using a five-level Likert scale, and the correlation variables are calculated by summing and averaging the corresponding scale statements in the questionnaire analysis for statistical analysis.

The Pearson correlation analysis revealed that the perceived information value showed a significant positive correlation with user stickiness ($r=0.599$, $p=0.000$), which indicated that the stronger the users' perception of the information value of pan-knowledge videos, the more likely they were to generate a higher degree of usage stickiness, and the research hypothesis H1a was supported. Entertainment value shows a significant positive correlation with user stickiness ($r=0.703$, $p=0.000$), indicating that the stronger users perceive the entertainment value of pan-knowledge videos, the more likely they are to generate a higher degree of usage stickiness, so the research hypothesis H1b is supported. Emotional value and user stickiness also show a significant positive correlation ($r=0.624$, $p=0.000$), which indicates that the stronger users perceive the emotional value of pan-knowledge videos, the more likely they are to generate a higher degree of stickiness, and the research hypothesis H1c is supported. In summary, the research hypothesis H1 is supported - the perceived value of pan-knowledge-based videos positively affects user stickiness.

The Pearson correlation analysis found that perceived ease of use showed a significant positive correlation with user stickiness ($r=0.611$, $p=0.000$), which indicated that the easier users were exposed to pan-knowledge videos, the stronger their stickiness to pan-knowledge videos and the research hypothesis H2 was supported.

Pearson correlation analysis also found that social influence showed a significant positive correlation with user stickiness ($r=0.677$, $p=0.000$), indicating that users' stickiness to pan-knowledge videos was influenced by their surrounding peer group, and research hypothesis H3 was supported.

The one-way ANOVA revealed that there was a significant difference in user stickiness among users with different education levels ($F=3.285$, $p=0.022$), among which respondents with graduate degrees and above had the strongest stickiness to use pan-knowledge videos, with a mean value of 3.86. Thus, it can be seen that users with higher education levels have stronger willingness to access pan-knowledge videos.

## 5 Summary and Reflection

The study found that perceived utility (including perceived information value, perceived entertainment value, and perceived emotional value) and social influence positively affect user stickiness, perceived ease of use negatively affects user stickiness, and there are significant differences in user stickiness among users with different education levels.

(1)Perceived value positively influences user stickiness.

At the level of information value, as the dividend of entertaining short videos fades, people gradually start to think about the value embedded in short videos. In the post-epidemic era, pan-knowledge videos can meet people's demand for knowledge, relieve the information anxiety generated by pan-entertainment, and realize the return of the value of short videos. Therefore, users who are aesthetically burned out of purely entertaining short videos gradually start to pursue pan-knowledge short videos that can convey personalized knowledge. At the level of entertainment value, pan-knowledge short videos often use questions and answers from the sky or interesting science popularization of life knowledge as content, with animation or humorous language, adding fun to learning for users.

(2)Perceived ease of use positively affects user stickiness

The main audience of pan-knowledge short videos is also young users, who have a high demand for pan-knowledge short videos in terms of education and occupation. At the same time, young users are not only willing to be consumers of short videos, but also committed to producing pan-knowledge short videos and becoming the creators of core content accept passively. Therefore, Bilibili, which has a good audience, has become a channel for easy access to pan-knowledge short videos. At the same time, the highly educated groups tend to be exploratory and have a high desire for knowledge and a strong desire to explore new fields, so the specialized contents of pan-knowledge short videos have a stronger appeal to the highly educated groups with higher academic qualifications.

(3)Social influence positively affects user stickiness

Unlike other short video platforms, Bilibili has a circle culture at the beginning of its establishment, i.e. "Two dimensions circle", and later attracts more and more young users as it develops. Nowadays, there is still a circle culture in Bilibili, and users in the same circle have a greater influence on each other. Moreover, the current "head" bloggers of pan-knowledge short videos deepen group awareness by creating core IP and interacting with viewers' pop-ups. For example, "Zhang San, an extra-legal fanatic" often appears in the fan group of "Luo Xiang

Speaks Criminal Law", and "Water Monkey" often appears in "Infinite Xiaoliang's Popular Science Daily". "When users participate in the discussion of related topics in society, they construct group memories by collecting individual memories, and the resonance of IP topics makes users gain more participation and trigger group identity.

On the other hand, it is worth noting that this study also finds that there are some problems in the development of pan-knowledge videos. Some pan-knowledge videos have false and inaccurate content, and some videos have serious homogenization problems, causing aesthetic fatigue and negatively affect users' stickiness, which is worthy of caution and reflection. However, because the sample of this study is relatively single and limited, there is a shortage of in-depth analysis of the sample, and there are some users in the sample who have not watched pan-knowledge videos on Station B. In future studies, researchers in the field of pan-knowledge videos may need to pay more attention to the comprehensive comparative analysis of other short video platforms such as Jitterbug and Racer to expand the research and practice of pan-knowledge videos.

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