

Revisit Participatory Culture: Analyse the Effect of Online Fitness Education on Communication

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Abstract

Since the outbreak of the coronavirus, health problems have become prominent. Under the impact of community lockdowns caused by the coronavirus, online fitness has become more popular for three main reasons. First, online fitness synthesises sports and internet technology and provides a platform for exercise. Second, with the development of 5G technology, online fitness can exercise at any place and time of fragmentation. Third, compared with the traditional model, online fitness has both type and price advantages. However, due to the weak sense of participation in online fitness, users will inevitably feel lonely. Nevertheless, by sending bullet screens, users have created a new participatory culture. This research selected over 100,000 bullet screens from *Bilibili*, a comprehensive video community with a high concentration of young generations in China. The authors also use Python to analyse these bullet screens for content and emotion analysis from the time and content dimensions. The results show that compared with the traditional model, the fitness video can bring more sense of participation and presence, and the impact on users' enthusiasm is positive, which will further prove that participatory culture plays an indispensable role in the effect of community

health. In addition, this study also finds that over time, user engagement in bullet screens with the same video decreases.

Keywords: Online fitness, community health, participatory culture, bullet screen, communication effect

Introduction

In recent years, with the development of 5G, artificial intelligence, and big data in China, online fitness has come into being. As of June 2019, Internet users in China reached 854 million, and the Internet penetration rate was 61.2 percent (Huang, 2020). Online fitness has expanded rapidly since the COVID-19 pandemic began in 2020. According to relevant statistics, the General Administration of Sport has mobilised famous coaches and athletes to make fitness videos, and they have played over 2.6 billion times on Internet platforms. Moreover, people have responded to more than 2 billion "family exercise" videos created by the Lek Movement (Liu & Fu, 2020).

There are several reasons for the development of the online fitness industry. First, online fitness integrates sports and Internet technology, providing a platform for people to exercise (Zhong, 2020). It avoids the risk of coronavirus infection from going out to exercise and reduces boredom under lockdown. Second, with the development of Internet 5G technology, the online fitness scene can fully use convenient venues and fragmented time for physical exercise (Zhong, 2020). In addition, during the pandemic, the space for sports activities was narrow, and the acceptance of online fitness education increased rapidly. Third, the disadvantages of offline traditional gyms have increased. The failure and bankruptcy of offline traditional gyms, which have weak operation ability and unstable capital flow, have brought great insecurity to people. Online fitness exercise types are diverse and not limited by fitness equipment; people can experience quality courses at a low price. It can not only customize exclusive courses and equip people with reliable fitness coaches but also increase the supervision, interaction, and evaluation in the later stage, giving people sports companionship. In addition, without considering the inconvenience of transportation and time limits, people favour online fitness.

Recently, social media has publicised relevant information that long-term effective exercise can improve human immunity and reduce disease risk. Especially during the pandemic, people's strong body immunity played an important role, making them realise the importance of maintaining their daily health. Being at home for a long time can easily lead to psychological and

physiological maladjustment. Especially for people living in cities, due to the small range of activities and long-term sedentary or incorrect sitting posture, it can easily lead to shoulder and neck pain, obesity, and other problems. In addition, the loneliness of a long lockdown life and the fear of the infection of the epidemic quickly lead people to psychological anxiety. Therefore, a long-term and adequate exercise can form a virtuous circle of physical and mental health, and online fitness has become a new fashion during the pandemic.

However, with the development of online fitness, new problems have emerged. Due to the weak experience of online fitness, unintuitive participation, lack of communication with coaches and other trainees, and intense loneliness, people need help to persist. At the same time, the dull and uneven content of online fitness videos makes it difficult for beginners to master the essentials and matters needing attention in a short time (Zhong, 2020). The fitness video of the *Bilibili* Bullet Screen Website (hereinafter referred to as *Bilibili*) creates a new participatory culture of online fitness by publishing bullet screens and leaving messages to each other. The participatory culture was proposed by American scholar Henry Jenkins in 1992. It refers to a new form of media culture created on the Web 2.0 network platform, with all Internet users as the main body, through a specific identity, and in the main form of actively creating media texts, disseminating media content, and strengthening the network.

This cultural form contains the characteristics of freedom, equality, openness, inclusiveness, and sharing (Jenkins, 1992). As an open text on the network platform, the bullet screen is consistent with the elements of participatory culture. Through the spontaneous participation of Internet users in the manufacture of bullet screens, they can realise their identity and feedback on the video creation (Sun & Zhao, 2018). Online fitness video on *Bilibili* has attracted a large number of users, not only providing a variety of information for the people but also creating a new way of communication. *Bilibili* fitness video presents many bullet screens that change the loneliness of exercising alone, lay the foundation for collective identity, form a natural fitness community, and improve user engagement. People improve their interest and enthusiasm in sports by watching and publishing bullet screens for communication. They change their role from simple users to active participants and producers of Internet content and cultural products.

Previous studies on participatory culture mainly start from the traditional media environment, focus on the participation of fans in the entertainment industry, and emphasise the opposition between subculture and mainstream culture. In today's Internet environment, many areas of society have undergone significant changes, such as the emergence of participatory media platforms, the growing subcultural groups, the extension of commercial power, and the enhancement of democratic consciousness. The participatory culture now has new characteristics and forms of transmission. These changes have permeated all areas of society, producing indispensable impacts and reshaping participation culture itself. It breaks through the previous focus on text meaning and enters a new research field.

This research focuses on whether the critical value of online fitness video communication effect is enhanced under the background of participatory culture in *Bilibili*. Does the bullet screen interaction through *Bilibili* increase users' enthusiasm for online fitness? Do similar online fitness videos make sense? To answer these research questions, this study selects the bullet screens in the top ten videos played by online fitness uploader *Palame* on *Bilibili*. Each video is selected with 5,000 bullet screens, with about 100,000 bullet screens for statistics. The researchers analyse the research questions through the time and content dimensions.

Literature Review

Participatory culture from fans

The research on participatory culture should be traced back to the relevant studies of Henry Jenkins. As the founder and principal of the MIT Comparative Media Studies program, Jenkins described the Star Trek fan community in detail in his early work *Star Trek Rerun, Reread, Rewritten: Fan Writing as Textual Poaching* (1998). It was believed that fans could transform their response into social interaction and the watching culture into participatory culture (Jenkins,1998).

In the above works, he introduced the concept of textual poaching and analysed the tension between the producers of popular texts and the fans who misappropriate these popular texts. Continuing this analysis, Jenkins published his influential book *Texture Poachers: Television Fans and Participatory Culture* (2013) and conducted a more in-depth discussion on participatory culture. This book used an ethnographic research method to analyse fan culture. It

mainly studied the cultural development of fan groups and the complex relationship between consumers and traditional media under the institutional conditions at that time.

Jenkins believed that participatory culture was generated and developed from the fan community, which was a characteristic reflected by the fan group. The behaviour of media users constitutes the participatory culture, and users continue to add and integrate into the process of cultural development, update the existing cultural information, promote the generation of new content, and form an effective cycle (Jenkins, 1992). Although Jenkins emphasised the participation of fans in the production of media content, he needed to realise that such participation virtually enhanced the attention and influence of cultural products and changed the meaning of the original cultural production (Han, 2016). Although Jenkins did not theorise participatory culture at this time, he began the era of audience research.

Jenkins' early research on participatory culture mainly focused on TV texts. After misappropriating popular texts, he focused on the fan community to create new fan works through science and technology. Jenkins was highly optimistic about fans and believed fans are the winners, but it also had limitations. He should have paid more attention to the behaviour characteristics of fans, confused participatory culture with fan culture, and ignored the reproduction and upgrading of information.

Therefore, his early understanding of participatory culture was limited to specific fan groups, which was still limited to the circulation of text meaning. Since then, Jenkins further deepened his study of participatory culture. He believed that media integration is essential for forming a participatory culture. Media integration described the changes in media ownership and text production, such as cross-industry integration of large companies. The continuous concentration of media ownership, and the adaptation of novel texts into mobile games had broken the barriers to interoperability between texts (Jenkins, 2003).

Participatory culture in the Internet era

With the advent of the Internet era, Jenkins no longer focused on single

fan culture but explored the intersection of media integration and participatory integration behind fans. In the context of integrating multiple media, more diversified forms of mass participatory media were gradually replacing the situation where traditional media controlled the production and flow of information in the past. This transformation enriched the content created by positive audiences and provided an opportunity for their group expansion and the dissemination and sharing of collective wisdom.

The development of participatory culture was inseparable from a broader range of community contacts and more knowledge collection and sharing. In this regard, the development prospect of participatory culture should be brighter in the network environment. With the popularisation of Internet technology, fans have found new ways of communication and formed a new network culture. Recognising this, some scholars expanded Jenkins's original concept and took the Internet and online communication as the core components of their research on fan groups.

For example, Nancy Baym explored the Internet's role in forming fan communities, especially soap opera fans (Baym, 1995). Thomas Lamar believed that participatory culture was a relatively neutral concept without the meaning of cooperation or resistance. Although it emphasised the social significance of fan participation, it did not believe its fan behaviour had any cultural mission significance (Lamarre, 2010). Lauters studied the network culture of fans and paid particular attention to the novel creation of fans of "Lois and Clark" (Lauters, 2001).

In addition, after recognising the Internet's critical role in contemporary fan groups' activities, Jenkins turned to research the network culture of fan groups (Jenkins, 2006). Fan culture was closely related to participatory culture. Jenkins believed that participatory culture was fans' cultural production and social communication. At first, fans sought a way of activity that was different from that of other viewers (Jenkins & Ford, 2013). Benefiting from the explosion of new media technology, fans also used the network as a powerful channel to archive, annotate and disseminate content different from traditional media production. Their active participation made the fan culture in the secondary cultural state gradually move toward the mainstream.

The development of participatory culture

In the research background of Internet media integration, participatory culture had a new development. It was connected with the development of the

media industry and integrated from the perspective of content production between producers and consumers. The communication pattern of participatory cultural research had also changed, which was no longer limited to the original fan community but expanded to a broader cultural field. Everyone's role could be transformed, realising two-way communication between producers and consumers and participation in the production and creation of media.

From the perspective of audience creation, freedom, openness, tolerance, and sharing were the main characteristics of participatory culture. Cai (2011) argued that the participatory culture in communication was mainly reflected in the change of communication mode, the transformation of communication receiving relationships, the development of shared culture, and individual interactive reconstruction. These studies sorted out and established the concept of participatory culture.

Based on Jenkins' research, people connected media literacy with cultural communication and believed this was a social skill. At the same time, improving literacy also played a vital role in participating and developing a culture that discussed the problem of media literacy in the participatory cultural environment. In recent years, with the forwarding, interaction and cross-platform sharing mechanism of social networks represented by short videos, audience participation was no longer a matter of individuals or minorities but a national interaction. As a new media culture grows with communication technology, participatory culture has more rights in changing the audience's role, from individual fans to fan groups and then to commercial communities. In the future, participatory culture will cover a broader range.

Methods

Data screening indicators

This study chooses *Bilibili* as the platform to collect users' bullet screens as the research object. This study analyses the users' bullet screens from two dimensions; time and content (Figure 1).

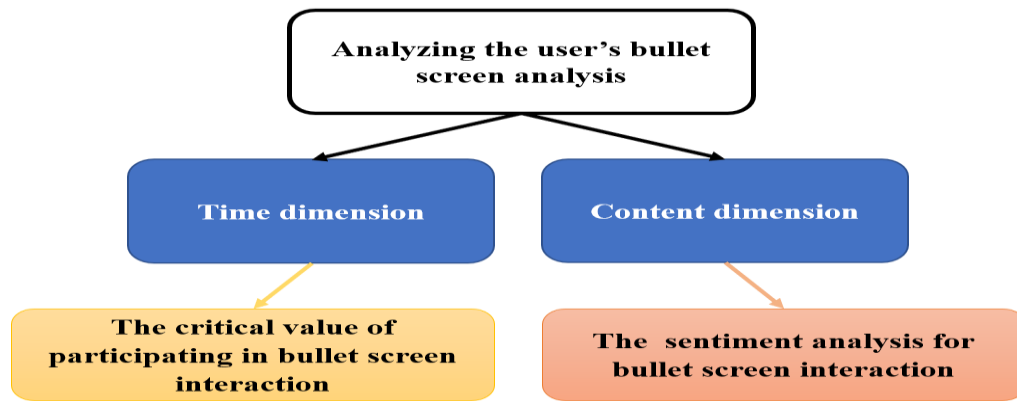


Figure 1 Framework for Analysing Users' Bullet Screens

As for the principle of video selection, first of all, this study's experimental videos need to have the effect of yoga teaching, and the videos should contain the action introduction, timing, preview, pause, and rest. Then, the researchers found the uploader, "Pamela", whose video contribution files affect yoga teaching. From that, the researchers sorted the amount of video play according to all her videos and selected the top 25 videos for analysis. Finally, there are 101,835 bullet screens in total. Figure 2 displays the part of the original view data.

1	The bullet screen	Appearance time of bullet screen in the video	Time	Date	User's ID
2	The first day of Song Shuli's lover	0.339	22:39:35	2021/1/7	b0fc4845
3	The cat is scratching its hair	572.939	17:55:30	2021/5/14	1134dcd1
4	End of day 1 participation	597.226	6:58:41	2021/5/14	c8a92610
5	The feature video begins	618.025	22:45:04	2021/5/13	e4298fdd
6	Xiao Zhan's wife participated on the first day	29.631	20:38:28	2021/5/13	c2bbc846
7	Bad waist, broken neck	310.579	20:00:59	2021/5/13	d944969f
8	The second week	860.99	19:40:10	2021/5/13	bcd679c
9	The pace was so fast on the first day	3.72	18:56:43	2021/5/13	7ade296a
10	The first day!	631.713	18:52:02	2021/5/13	7ade296a
11	kk The first day ♡ ^ ▽ ^ ♡	299.588	10:44:01	2021/5/13	bcac361c
12	kk	296.109	10:43:25	2021/5/13	bcac361c
13	Wow, I'm dead	676.378	7:41:36	2021/5/13	2f972c69

Figure 2 Data List of Some Bullet Screens

TF-IDF value

The data for this experiment was obtained by collecting fitness videos related to *Bilibili* online fitness. After obtaining the data, the researchers filtered the data. If the duplicate ID sends several identical bullet screens, the interference with the experimental results will be reduced. At the same time, stop words, such as connectives (i.e., "but", "and"), modal particles (i.e., "ah", "la"), adverbs (i.e., "of"), and other words that have no practical meaning in text

analysis were removed through corpus selection. After preliminary data processing, the TF (term frequency) algorithm calculates the importance of keywords. The TF algorithm is an analysis method based on statistical principles. It is mainly used to evaluate the importance of a word to a document set and is often used for keyword importance analysis of the long text. The main idea is that the importance of a word is positively correlated with its frequency in the document.

TF represents term frequency and the number of word occurrences in the document. TF equals the number of occurrences of a word in the document divided by the total number of words. Its calculation formula, which was introduced by Huan and Tianqi (2021) is shown in Figure 3. When a word's TF value is greater in a document, it means that the word is more important to the document and can represent the tendency of the emotional theme of the document content.

$$TF_{t,D_i} = \frac{Count(t)}{|D_i|}$$

Figure 3 TF Calculation Formula

Word class analysis – SnowNLP

Several emotional topics can be learned through training in the SnowNLP model of Python. The main functions of SnowNLP include Chinese word segmentation, word-class annotation, emotion analysis, text classification, *Pinyin* conversion, traditional to simplified, text keyword extraction, abstract extraction, sentence segmentation, and text similarity. The practical analysis is establishing a corpus to calculate the effective coefficient of words (or sentences) in this situation. Its value range is between 0 and 1; the closer the value is to 0, the greater the negativity of words. On the contrary, the closer the value is to 1, the more active the word is.

Then, according to these topics, the researchers analyse the affective coefficient of users' bullet screens. If the frequency of positive theme keywords in bullet screens is high, users are willing to participate in online fitness education videos. If the frequency of negative subject keywords in bullet screens is high, it can be judged that users are unwilling to participate in online fitness education videos. The results analyse users' attitudes towards online

fitness education video support or opposition. The researchers, then, can discuss the significance of online fitness videos and analyse whether they are worth popularizing.

Text analysis is a new technology proposed in the era of artificial intelligence and the product of digital society. Text analysis belongs to the field of artificial intelligence. It mainly refers to retrieving the text content and extracting the primary information. The feature words in the text are extracted and quantified by corresponding technical means, and its main content is feature extraction. The researchers selected the bullet screens of *Bilibili* and pre-processed bullet screen content data. User ID and bullet screen content information are processed and analysed for two headers. Using TF-IDF and SnowNLP analysis model results and other steps, the researchers selected the bullet screen content in the fitness video on *Bilibili* for text analysis and affective coefficient analysis to judge the user's attitude towards online fitness education. At the same time, by observing and analysing the peak time node of the bullet screens, the researchers analyse the reasons for more bullets at this time node, explore users' interests and improve users' enthusiasm to participate in online fitness education videos.

Results

The critical value of bullet screen interaction

Compared with offline teaching and ordinary video learning, online teaching of bullet screen video can give users more sense of participation and presence. The real-time nature of the bullet screen teaching means that the bullet screens sent by users will be displayed in real time during the video. This type of bullet screen will give the users a sense of on-site participation. This can break through the limitations of time and space, allowing users to communicate with each other beyond physical boundaries. For online teaching videos, especially fitness, which is challenging to adhere to, the presence of the bullet screen allows the audience to experience that *"I am not working out alone."* The presence of the bullet screen while watching the video can also motivate users. In addition, how long the presence and motivation brought by the bullet screen can last is a problem worth pondering, and this study is based on it to discuss the critical value of bullet screen video teaching.

This study defines the days that 90 percent of the users no longer insist on continuous bullet screen punching as a critical value, discusses the effectiveness of bullet screen online teaching, and proposes follow-up

improvement measures. Data used for analysis includes the user ID, the time of sending the bullet screen, and the content of the bullet screen. To analyse the critical value of online learning for the same user, the group by function is used to gather the bullet screen content sent by the same user ID as a cluster to facilitate subsequent visual analysis. After the statistics, there are a total of 43,868 user IDs. For this, the researchers analysed the fitness video further, as shown in Figure 4.

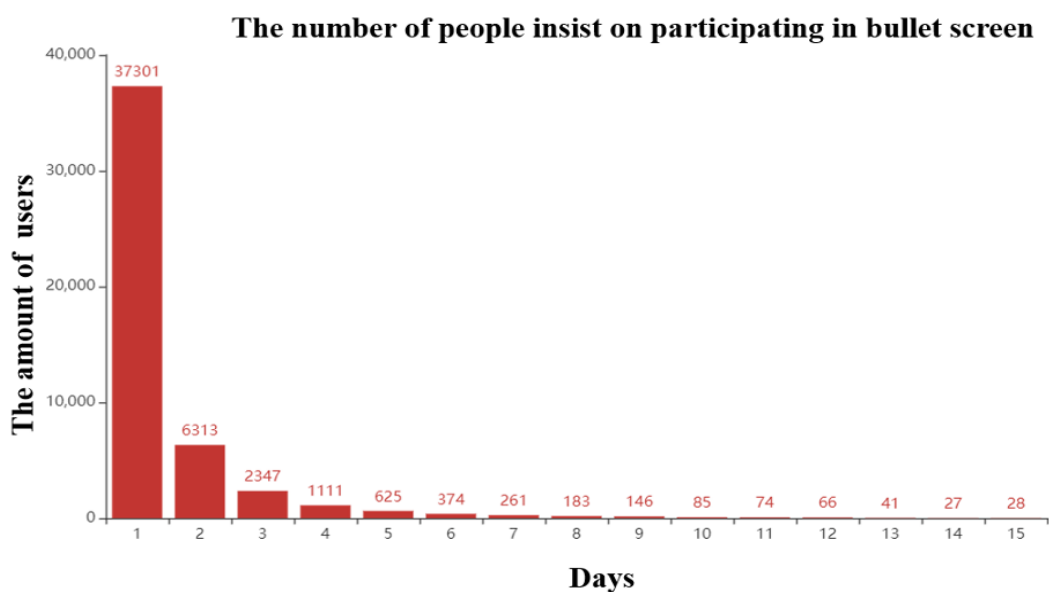


Figure 4 Relationship Between the Number of Days Users Participate in the Bullet Screen and the Number of People Who Insist On It

By Figure 4, we can see that the abscissa of the line graph is the number of days of persistence, and the ordinate of the line graph is the total number of people. To further determine the critical value of online fitness education, we selected 90 percent of the total number of people as the influential audience, which is 39,481 ($43,868 \times 90\%$). Overall, the bar chart shows a downward trend and online fitness education for most users is not continuous. Ninety percent of the users stopped participating in bullet screens from the second day, and the follow-up changes in the number of check-ins also tended to be small. Therefore, we can determine that the second day is the critical value of the online yoga classroom video.

Moreover, the users' participation in the bullet screen decreased drastically on the third day. The sense of participation in the bullet screen does

not bring about sustainability. We can see from Figure 4 that only 10 percent of the users still insisted on bullet screen participation after the third day. Users' enthusiasm for bullet screen participation could be a lot higher. Fitness is achieved after some time, but sudden fitness will bring body soreness on the second or even third day, which is also one of the reasons why the follow-up will not be continuously clocked in. At the same time, we found that most of the bullet screen content is positive, expressing their enthusiasm for online learning. Therefore, the following analyses users' specific online learning enthusiasm from the content level.

The sentiment analysis for bullet screen interaction

As mentioned above, the number of days for user bullet screen participation could be much higher. Ninety percent of users lost interest in bullet screen interaction on the third day. Nevertheless, the researchers analysed the content of the bullet screen they posted after conducting TF-IDF analysis. They found that the most frequent occurrences of content posted by users are "Day 1", "Day 2", "Wife", and other remarks that tend to actively participate in the bullet screen, as shown in Figure 5.

It can be seen from Figure 5 that the interactions with the bullet screen are all optimistic. Therefore, the researchers used a more precise sentence segmentation method so that the content of each bullet screen is equivalent to a sentence, with no more word segmentation but sentiment analysis of each bullet screen. In this way, the emotional distribution of the user bullet screen can be analysed more accurately. The researchers, then, performed sentiment analysis on the content of the entire bullet screen, and by calling the SnowNLP toolkit, they scored the sentiment of each bullet screen with a value ranging from 0 to 1; the closer the resulting value is to 1, the positive the sentence is—the results of our step-by-step analysis of 101,835 pieces of data, as shown in Figure 6.

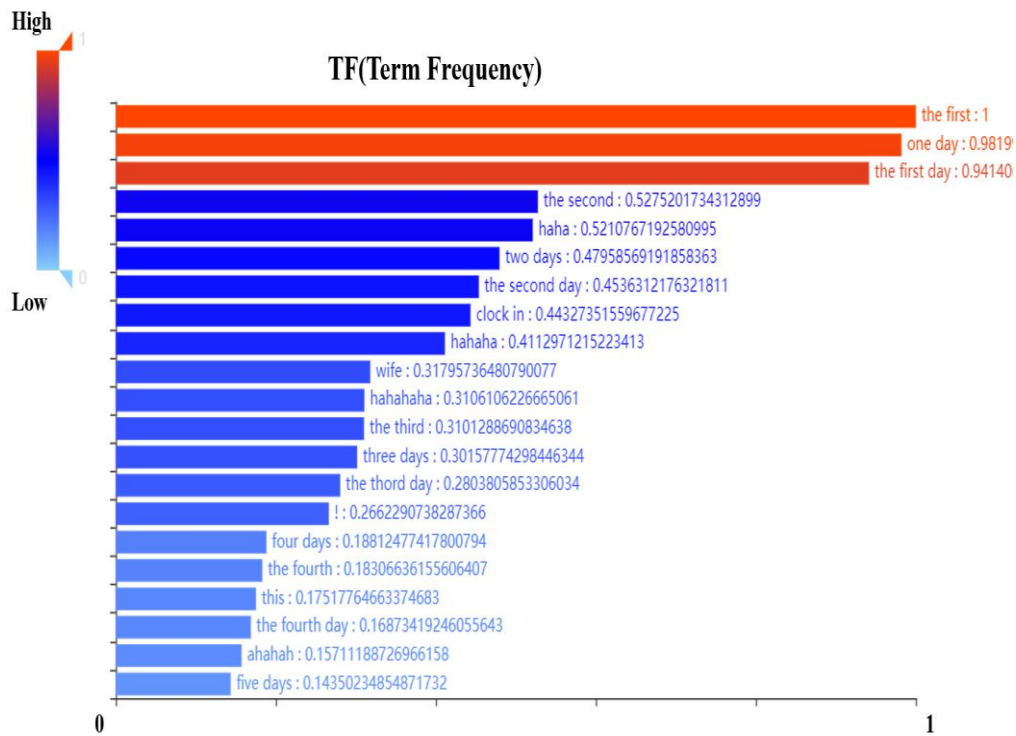


Figure 5 TF-IDF (Term Frequency-Inverse Document Frequency)

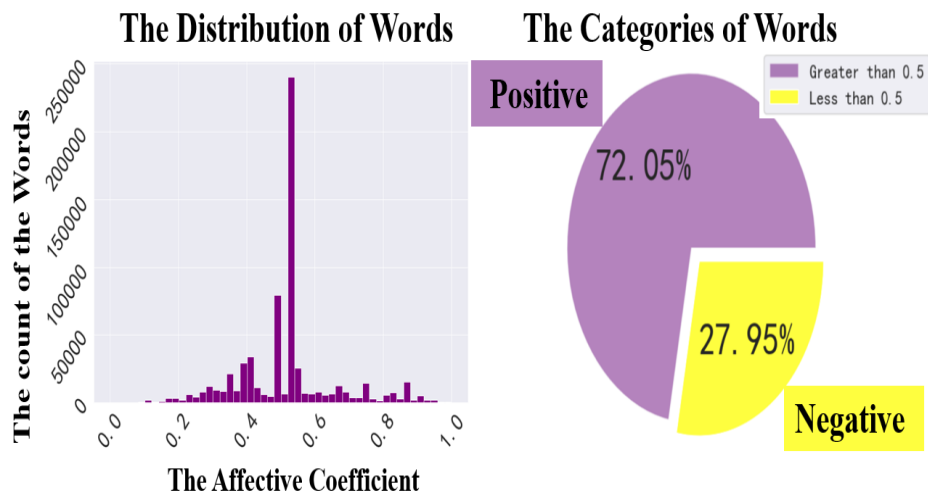


Figure 6 Analysis Results of the Words (Bullet Screen)

The results of calculations through algorithms and models show that the positive content in the bullet screen content accounted for 72 percent of the total bullet screen. A high proportion indicates that users generally believe this online fitness education video can meet their fitness needs. The text content of the bullet screen generally believes that this realistic fitness

education video can achieve the effect of weight loss and plasticity. Although

it is very tiring and requires persistence, it can be seen in the bullet screen that you can see the keywords of mutual encouragement and express the effect of weight loss, such as "lost a few kilograms in a few days" and "the waist has been thinner by a few centimetres" and "persistence means victory". When users see this kind of bullet screen, they will be more willing to participate in this online fitness education.

In terms of communication effects, many users participate in positive emotional communication, and they can express their opinions in a timely and complete manner while paying attention to the actions of the video, which can achieve a positive communication effect. It shows that the users' affective coefficient is biased towards supporting online education and fitness videos, and they are also willing to participate in online education and fitness videos. Therefore, online fitness education videos are of promotional significance in this information era.

However, how can we promote to achieve a more ideal effect? As shown in the visualization effect of Figure 7, the amount of observing bullet screens will increase at some nodes. When the researchers went back to watch the video content based on the node information, they found that when some unexpected scenes appeared in the video, such as cats and dogs, or when advertisements appeared, the volume of the bullet screen increased sharply. This phenomenon shows that when the volume of the bullet screen increases, the user's participation in the bullet screen increases, thereby improving the video's communication effect. Users tend to be more active when facing fresh scenes. Therefore, online fitness videos should know the interest of users through the specific text content of the bullet screen, the nodes where the amount of bullet screen peaks, and the highlights of the innovative video to attract users to participate in the discussion of the bullet screen and increase the enthusiasm of users. Participation in the discussion and feedback of video connections to a greater extent contribute to better communication effects.

Discussion and Implications

Through the above data analysis, the researchers have effectively verified the previous hypothesis that online fitness education through *Bilibili* can enhance users' fitness enthusiasm and further confirmed that participatory culture plays

an indispensable role in the communication effect of online education. From the content and time dimensions of the specific comparison and analysis, the study found that most users reach a critical level of engagement, which starts to decline around three days. This engagement and interaction will increase the user's motivation, but this motivation can only be maintained briefly.

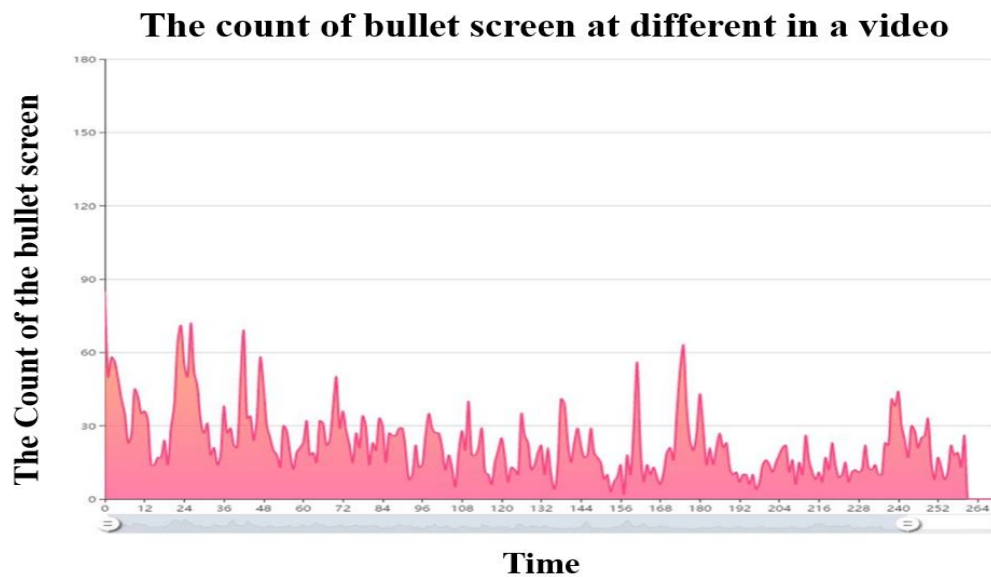


Figure 7 Count of Bullet Screens At Different Times in A Video

As mentioned earlier, Jenkins proposed in his book *Text Poachers* (2016) that participatory culture was a new type of culture actively created through a sense of identity. In the past, the role of passive learners had changed from being a mere receiver to a producer of meaning, and they could even perform secondary processing and output of the original content (Li, 2020). *Bilibili's* bullet screen brings users a fully interactive experience, where each user watching a video can send their thoughts and project them onto the video in real-time. At the same time, *Bilibili* has a strict review system, so the website's video quality is relatively high, in addition to commercial marketing, sexual violence, and other strict screening, but also to ensure that the video content is professional. As a result, *Bilibili* has become the platform of choice for users, which theoretically confirms why online video education can improve users' enthusiasm for participation through *Bilibili* videos.

According to the study, users choose *Bilibili* fitness videos for three

reasons. The first is to meet the function of self-improvement and achieve the purpose of fitness or shape. Convenient online video has become the first choice of many people since the epidemic, and it is both economical and convenient. The second is that the interactive nature of *Bilibili* video satisfies users' entertainment needs. According to Freud's personality theory, everyone has his musical principle, which will drive human beings to find ways to satisfy all happiness. This process of bullet screen interaction is like participating in a grand carnival with an entertainment spirit to realise the process of active participation, the pursuit of happiness, and the realisation of the subconscious self. For example, in a fitness video, people laugh at themselves for being unable to do specific complex movements or interact regularly to show persistence. The third is to satisfy the identity. The degree to which bullet screen text content is recognised determines how self-identity can be realised. The bullet screen text repeatedly sliding on the screen will also give the creator a kind of affirmation and satisfaction, such as "*before high-energy warning*" or "*pay attention to the difficulty of the next action*". Generally speaking, whether it is text analysis or sentiment analysis of content, the appearance of a bullet screen will undoubtedly increase users' enthusiasm, but from the timeline's perspective, users' enthusiasm will appear as a critical value within two or three days.

This study still has some things that could be improved. In the initial study of the bullet screen, although the video selection is based on the video with the highest "three consecutive digits" in the search list, the seemingly fair principle will also be affected by the recommendation algorithm, which is currently challenging to eliminate. The number of bullet screens used for analysis is also limited. The number of bullet screens for each video is limited to 2,000. However, the number of bullet screens for each video will exceed this number, making the analysis a one-sided interpretation to some extent. In addition, among the suggestions proposed in the study to improve video interactivity through 3D technology, this technology is still in its infancy. It has yet to be promoted, so obtaining user feedback data or quantifying and analysing users' sense of use is impossible, and its feasibility needs further experimental research. Nevertheless, in general, this study gives a new interpretation of participatory culture under the category of Web 2.0 from a new aspect. It provides a specific solution based on Web 3.0, which is positive and beneficial to analysing the communication effect of online fitness education.

Conclusion

Although the development of bullet screen video is rapid, there are also various challenges and problems in the process of increasing popularity. In analysing the time dimension, the time for users to send bullet screens is relatively concentrated, especially for fitness videos. With the increase of days, the number of people who check in gradually decreases, which means that users are initially attracted to choose fitness videos. There must be more than three motivations for participation to maintain users' enthusiasm. Interactivity is essential in improving user participation, but more than simple bullet screen interaction is needed to maintain the user stickiness of online fitness. Most users give up because fitness is demanding and challenging to adhere to. After completing a workout, they feel exhausted and tend to do short or easy videos like "three minutes of lean shoulders" or "five minutes of lean thighs." From this perspective, in terms of how to improve user engagement in the future, the study proposes 3D reconstruction technology, aiming to enhance the interaction between users and videos through embodied communication so that users can be fully immersed in fitness videos and improve the communication effect of online fitness education.

Embodied communication refers to the flowing interaction interface between the body and media technology, which stimulates embodied perceptual experience. After entering the era of intelligent communication, communication has been transformed concretely; that is, integrating the body and media has become a new way of communication. Embeddedness emphasises the embedding and interaction between the body and the environment, reconstructing the existing spatial and temporal patterns while reshaping the user's sensory experience. Embodied communication can increase the active participation of online users, improve the efficiency of online teaching, and enhance the effect of communication. With the development of the human-computer interaction interface, this intelligent communication based on 3D technology has constructed a realistic way of existence for the body and tapped the potential of embodied perception in communication practice.

Specifically, this study collected some fitness videos on *Bilibili*, reconstructed the uploader Pamela in the video in 3D, and transformed her standard actions into standard guidance videos, which were compared with

user videos in real-time. At the same time, the user's movements are scored to indicate which part of the body needs to be corrected, and this real-time immersion allows the user to engage with the fitness video and improve the interaction fully. Moreover, once the user's movements are not standardised, they can be corrected according to the prompt, thus significantly improving the user's fitness experience, and helping the user to adhere. Therefore, making a complete set of videos improves the communication effect of online fitness education, which can also be regarded as one of the future advantages of online fitness education.

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