Click It! How the Features of Educational Video and Influencer Impact the Digital Consumer Engagement

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Abstract. The educational short video has emerged as a practical approach for influencers to connect with digital customers through social media platforms. However, there is a lack of empirical studies that use a mathematical modeling approach from social media data to focus on educational short videos. The present study examines that readability and the number of characters positively are associated with digital consumer engagement, but account verification is negatively associated with digital consumer engagement. The findings contribute to the literature by illuminating how elements of video and influencers contribute to digital consumer engagement in Douyin.

Keywords: engagement · short video · social media · ELM

1 Introduction

The proliferation of cultural and educational short videos on the Douyin platform has been made possible by the development of the Internet and new media technology, including the reduction of Internet costs, the popularity of mobile hotspots, and the low entry barrier for short videos [1]. According to Douyin's "Today's Headline & Bytedance Culture and Education Industry Data Report," the total number of culture and education creators fans has reached 5.42 billion, with a growth rate of 10,000 fans influencers of up to 330%. With the help of Douyin's preferential policies, educational videos have created a vivid image of an "encyclopedia" for audiences as a new way to popularize cultural and educational knowledge. The dissemination of educational knowledge in the form of short videos aids in the presentation of knowledge more interestingly, assisting audiences in absorbing knowledge and improving personal cultural literacy in fragmented time.

However, the dissemination effect of socialized cultural education shorts varies greatly, and the factors influencing the dissemination effect of cultural education shorts must be investigated. Most previous studies have focused on the dissemination effect of short videos and the factors that influence them. However, there is a lack of empirical studies that use a mathematical modeling approach from social media data to focus on educational short videos [2]. Using the exhaustive possibility model, we construct a theoretical model of the factors influencing the dissemination effect of educational short

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videos. Using the text analysis method and the mathematical model, we empirically test 106 short videos from five influencers. Exploring the influencing factors of digital consumer engagement is conducive to improving the dissemination power and influence of educational short videos on the Douyin platform and helping to promote influencers to create more accurate and positive high-quality educational content.

2 Theoritical Background

The Elaboration Likelihood Model is a classic model that explains how messages have persuasive effects and influence the attitudes of digital consumers [3]. According to ELM, users can take two possible paths with the help of the central and peripheral routes [4]. The path chosen is determined by the consumer's motivation and ability to deliberate and evaluate pertinent information. When users' motivation and ability are high, they tend to take the central route. Simultaneously, users will pay more attention to the information, and the attitude shift will be long-lasting. Users who lack motivation and the ability to process information will take the alternative route. In this case, users pay more attention to marginal cues that are not directly related to the information content. The communication of short videos is essentially a process of users being persuaded and changing their attitudes. Short videos can be seen as information consisting of text, images, and audio [5]. The digital consumer can be regarded as the users' attitude changing after persuasion. The behavior of users after being persuaded to like, comment, and share short videos can be regarded as a change of attitude [6]. Therefore, ELM can provide theoretical support for analyzing the factors influencing the communication effect of short educational videos on the Douyin platform. The conceptual framework shown in Fig. 1 is introduced based on the background literature presented in the preceding section.

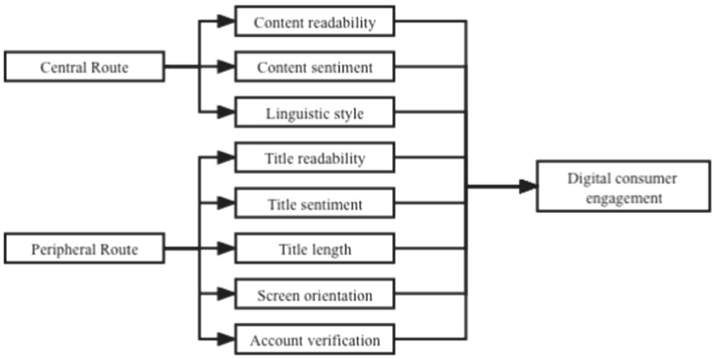

Fig. 1. Conceptual framework

3 Research Methodology

3.1 Data

The baseline data for this study was obtained from the data mining website Gooseeker.com. It was compiled by scraping influences' website on Douyin.com. Notably, the data mining tool is publicly available, allowing access to many influencers in different parts of the world. In this study, an automated web crawler and the html_request application programming interface were deployed to scrape the top five influencers whose content is education. During the manual data collection process, we tracked 164 videos posted by five influencers, posted from September 2021 to September 2022. These five influencers represent the higher consumer engagement and follower ratio. The influencers' data contain static characteristics, including (1) consumer interactions (i.e., the number of likes, comments, and shares) with video content on Douyin; (2) the information on the influencer's page (i.e., the number of followings, the number of followers, the number of videos posted and account verification).

To classify each video in terms of readability, sentiment, and linguistic style, we created an automatic program to convert audio from each video to text with the voice transcription API. We calculate the content readability and the title readability of video *i* as follows: (1) calculate the average number of words in each sentence; (2) calculate the proportion of adverbs and conjunctions in each sentence; (3) calculate the weighted average of the results of step (1) and step (2). We explore the pronoun usage in each video *i* using the LIWC software. According to the emotion recognition API and Pycharm software, we capture the content and title sentiment in each video *i*.

3.2 Operationalization of Variables

Based on the characteristics of ELM and educational short videos, this study constructs a theoretical model of the factors influencing the communication effect of short videos around the central route and peripheral route.

Every educational short video had three options for the digital consumer to leave likes, comments, and shares. Our primary measure of engagement is the weighted sum of likes, comments, and shares of each educational short video received. We should note that digital consumer engagement is not a perfect measure of influencers' content production. Douyin reports only those videos that are still publicly available, our measure of engagement does not account for videos deleted by influencers. Content readability and title readability were operationalized using the average number of words in each sentence and the proportion of adverbs and conjunctions in each sentence [7]. Readability is the level of ease of understanding a written text. We should note that the smaller the numeric of readability, the higher the readability. Content sentiment and title sentiment were the processes of collecting and analyzing information on how influencer present on social media [8]. According to the Baidu NLP model, sentiments are divided into negative, positive, and neutral. The percentage of pronouns calculated the linguistic style in videos influencers posted on their Douyin accounts [9]. Title length was operationalized using the count of the characters in the video's title [10]. Screen format and account verification were dummy coded [11, 12]. Table 1 summarizes the study variables' definition and operationalization, and Table 2 reports their descriptive statistics.

Table 1. Operationalization of study variables

Study variables	Operationalization
Engagement	The Weighted sum of likes, comments and shares received by influencers' videos by their follower count.
Content readability	Count of content which can be understood by users
Content sentiment	Dummy coded as negative = -1; Neutral = 0; Positive = 1.
Linguistic style	The percentage of pronouns in videos that influencers have posted on their Douyin accounts.
Title readability	Count of title which can be understood by users
Title sentiment	Dummy coded as negative = -1; Neutral = 0; Positive = 1.
Title length	Count of the characters in the tittle of video
Screen format	Dummy coded as Vertical = 0; Portrait = 1.
Account verification	Dummy coded as none = 0; Verified = 1.
TRT	The total running time of videos that influencers have posted on their Douyin accounts.
lnFollowers	Logarithm of the count of users who follow influencers' Douyin accounts.

Table 2. Descripitive statistics

Study variables	Mean	St. Dev	Min.	Max.
Likes	47,440	132,428	1.530	1,162,000
Comments	1487	4404	56	41000
Shares	8944	28422	65	177000
Content readability	46.61	39.40	6.9	232.5
Content sentiment	0.179	0.964	-1	1
Linguistic style	0.0476	0.0466	0	0.316
Title readability	17.9	8.725	6	53
Title sentiment	0.415	0.86	-1	1
Title length	25.03	8.967	7	59
Screen format	0.943	0.232	0	1
Account verification	0.443	0.499	0	1
TRT	61.66	30.16	19	180
lnFollowers	16.14	0.275	15.941	16.733

3.3 Model Specification

To capture digital consumer engagement, we calculate the user behavior with the weighted sum method, as Eq. (1) shows. Engagement is taken as its natural logarithm to obtain smoother data to reduce the influence of numerical differences on the analysis results and improve the goodness of fit. The OLS regression model shown in Eq. (2) was developed to investigate the proposed hypotheses. Engagement is a continuously measured and normally distributed numeric variable as the dependent variable, which makes using OLS regression appropriate. The OLS regression model incorporated main and control effects. The main effects are related to content readability, content sentiment, linguistic style, title readability, title length, screen orientation, and account verification. Finally, the model included TTR (total running time) and *followers* as control variables:

$$Engagement_i = 0.3Like_i + 0.3Comment_i + 0.4Share_i \tag{1}$$

$$\begin{aligned} \ln Engagement_{ij} &= \beta_0 + \beta_1 Content\ \ Readability_{ij} + \beta_2 Content\ \ Sentiment_{ij} \\ &+ \beta_3 Linguistic\ \ Style_{ij} + \beta_4 Title\ \ Length_{ij} \\ &+ \beta_5 Title\ \ Sentiment_{ij} + \beta_6 Title\ \ Readability_{ij} \\ &+ \beta_7 Screen\ \ Format_{ij} + \beta_8 Account\ \ Verification_{ij} + \beta_9 TRT_{ij} \\ &+ \beta_{10} lnFollowers_{ij} + \varepsilon_i \end{aligned} \tag{2}$$

where β_1 β_2, …, β_8 are parameter estimates for the hypothesized effects, β_0 is the intercept, ε_i is a normally distributed error term, β_9 is the parameter estimate for the total running time (TRT), and β_{10} is the parameter estimate for the number of followers. The parameter estimates have a straightforward interpretation: a one-unit change in measures of the predictor variables will be associated with β_1, β_2, …, β_{10} unit changes in digital consumer engagement, respectively.

4 Results

Equation (2) was estimated using OLS regression. All the variables were standardized before estimation. The result of the model estimation are reported in Table 3. The overall model is significant ($F = 25$, $p < .000$), explaining 73% of the variance in digital consumer engagement. The residuals are normally distributed with $\mu = 0$, $\sigma^2 = 1$. The variance inflation factor (VIF) for the predictor variables ranged between 1.15 and 6.79, with an average VIF of 2.63, indicating no issues with collinearity.

Main effects Content readability is negatively associated with digital consumer engagement ($\beta_1 = -0.01$, $p < .01$), implying that educational video with a higher content readability garnered higher digital consumer engagement from their followers. Secondly, title readability has negative and significant effects on digital consumer engagement ($\beta_4 = -0.03$, $p < .01$), which means the title of educational video with a higher readability earned higher digital consumer engagement. Title length has positive and significant effects on digital consumer engagement ($\beta_6 = 0.01$, $p < .01$). Account verification has negative and significant effects on digital consumer engagement ($\beta_8 = -1.13$, $p < .01$).

Table 3. Summary of ols regression estimation

Study variables	Std. coefficients	Std. Error	T-value	Sig. Level
Intercept	-54.41	8.938	-6.09	0.00
Content readability	-0.01	0.002	-2.87	0.00
Content sentiment	-0.11	0.075	-1.40	0.16
Linguistic style	-0.47	1.653	-0.28	0.78
Title readability	-0.03	0.011	-2.59	0.01
Title sentiment	0.07	0.091	0.80	0.43
Title length	0.01	0.002	2.51	0.01
Screen format	0.01	0.296	0.06	0.95
Account verification	-1.13	0.319	-4.18	0.00
TRT	0.01	0.002	2.51	0.00
lnFollowers	3.99	0.555	7.19	0.00

Model summary, No. of observation = 106, $R^2 = 0.73$, $F = 25$, $p < 0.000$

Control effects we found a positive association between TRT (total running time) and digital consumer engagement ($\beta_9 = 0.01$, $p < .01$), which suggests that more total running time garners higher engagement. Number of followers is positively associated with digital consumer engagement ($\beta_{10} = 3.99$, $p < .01$), implying that influencers who have a higher follower count garners higher engagement from their followers.

5 Conclusions

The educational short video has emerged as a practical approach for influencers to connect with digital consumers by leveraging the trust and psychological bond that influencers have forged with their followers on social media [13]. Analyzing the educational short video of 106 of the top 5 educational influencers in Douyin, we affirm that content and title readability influence digital consumer engagement (likes, comments, and shares). Suppose the readability of the short video content is low. In that case, users may not fully understand the message conveyed by the short video and then quickly exit the short video, which significantly reduces the communication effect. Short video content with high readability, on the other hand, may lead to better understanding and learning, leading to liking, commenting, and sharing behaviors and improving communication, which is one of the core contributions of this study, which is based on empirical data exploratively confirming the role of readability of short video content on the communication effect, and that highly readable content will promote the communication of short videos. We also acknowledge that title length influences engagement with our further estimation. Longer title lengths help digital consumers understand the video content and reduce their cognitive effort and cost while watching it. We also acknowledge

that account verification hurts engagement. If digital consumers know that the influencer has been verified, they may perceive the influencers' profit motive, thus reducing trustworthiness and engagement.

To our knowledge, our investigation is the first to examine how the features of educational short videos affect digital consumer behavior. Our empirical also provides evidence that content readability, title readability, and title length positively and significantly impact digital consumer engagement. Moreover, we find that account verification negatively and significantly impacts digital consumer behavior.

The findings make two theoretical contributions to the influencer marketing literature. First, the findings contribute to the literature by shedding light on influencers' educational content and engagement strategy. Second, the findings contribute to the literature by developing and testing an empirical model that links influencers' content and engagement strategy with digital consumer engagement on Douyin. Overall, our findings offer novel insight into how educational influencer content and engagement strategy contribute to follower engagement behavior on Douyin.

The findings offer practical implications for Douyin educational influencers. For influencers, the finding suggests that efforts to increase content readability, title readability, and title length may benefit follower engagement. Therefore, influencers should pay attention to the level of users' cognitive ability when producing short educational videos and strive to balance specialization and popularization so that users will not give up due to insufficient cognitive ability. We suggest that influencers use their resources to improve the readability of short video content and create short video works that are easily understood and loved by users. If influencers want to create highly readable short videos with vitality, they should at least meet the requirements of "popular" and "interesting". "Popularity" means that the public should understand the content of short videos. Educational short video content has a certain degree of professionalism and seriousness. It can explain obscure jargon or professional knowledge in concrete and visual language to reduce the barriers to acceptance caused by users' lack of professional background knowledge. "Interesting" means that the content of short videos should be interesting. When making short videos, you can appropriately use some Internet buzzwords to narrow the distance between you and the users and make reasonable use of this herd mentality of the users, which can expand the influence of educational short videos.

As with any empirical research, this study has several limitations that provide avenues for future research. First, we only considered one social media platform, Douyin, though influencers connect with digital consumers across various platforms, including Weibo, Wechat, Red book, and Bilibili. Although our findings are likely to hold on other social media platforms, researchers could apply voice analyses and image analyses to influencers' posts on social media platforms as an extension of our work and try to replicate this research with micro-influencers and meso-influencers.

Second, we had not collected information on the characteristics of the consumers who interacted with the video posted by influencers. Characteristics of the consumers, such as age, gender, interest, and involvement, might affect the propensity to engage with a short educational video in Douyin. Future research could extend our research by using field experiments and testing our findings. Also, future research might consider

whether and how digital privacy concerns have affected digital consumer engagement with an educational short video.

References

1. D. Zulli and D. J. Zulli, "Extending the internet meme: Conceptualizing technological mimesis and imitation publics on the TikTok platform," *New Media & Society*, vol. 24, no. 8, pp. 1872–1890, 2020.
2. J.-H. Ye, Y.-T. Wu, Y.-F. Wu, M.-Y. Chen, and J.-N. Ye, "Effects of short video addiction on the motivation and well-being of Chinese Vocational College students," *Frontiers in Public Health*, vol. 10, 2022.
3. X. Zha, H. Yang, Y. Yan, K. Liu, and C. Huang, "Exploring the effect of social media information quality, source credibility and reputation on informational fit-to-task: Moderating role of Focused Immersion," *Computers in Human Behavior*, vol. 79, pp. 227–237, 2018.
4. Q. Xie and Y. Feng, "How to strategically disclose sponsored content on Instagram? the synergy effects of two types of sponsorship disclosures in influencer marketing," *International Journal of Advertising*, pp. 1–27, 2022.
5. X. Cao, Z. Qu, Y. Liu, and J. J. Hu, "How the destination short video affects the customers' attitude: The role of Narrative Transportation," *Journal of Retailing and Consumer Services*, vol. 62, p. 102672, 2021.
6. W. Tafesse and B. P. Wood, "Followers' engagement with Instagram influencers: The role of influencers' content and engagement strategy," *Journal of Retailing and Consumer Services*, vol. 58, p. 102303, 2021.
7. E. Pancer, V. Chandler, M. Poole, and T. J. Noseworthy, "How readability shapes social media engagement," *Journal of Consumer Psychology*, vol. 29, no. 2, pp. 262–270, 2018.
8. Y. Lin, D. Yao, and X. Chen, "Happiness begets money: Emotion and engagement in live streaming," *Journal of Marketing Research*, vol. 58, no. 3, pp. 417–438, 2021.
9. L. I. Labrecque, K. Swani, and A. T. Stephen, "The impact of pronoun choices on consumer engagement actions: Exploring Top Global Brands' Social Media Communications," *Psychology & Marketing*, vol. 37, no. 6, pp. 796–814, 2020.
10. S. Subotic and B. Mukherjee, "Short and amusing: The relationship between title characteristics, downloads, and citations in psychology articles," *Journal of Information Science*, vol. 40, no. 1, pp. 115–124, 2013.
11. B. Schivinski, "Eliciting brand-related social media engagement: A conditional inference tree framework," *Journal of Business Research*, vol. 130, pp. 594–602, 2021.
12. J. E. Dumas and R. A. Stough, "When influencers are not very influential: The negative effects of social media verification," *Journal of Consumer Behaviour*, vol. 21, no. 3, pp. 614–624, 2022.
13. C. Lou, S.-S. Tan, and X. Chen, "Investigating consumer engagement with influencer- vs. brand-promoted ads: The roles of source and Disclosure," *Journal of Interactive Advertising*, vol. 19, no. 3, pp. 169–186, 2019.

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