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Technological Affordances and Flow Experience: A Study of TikTok Users in Indonesia

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ABSTRACT

Researchers and practitioners are still trying to uncover the mechanisms that enable social media platforms, particularly short-form video content like TikTok, to provide immersive experiences for users. Indonesia currently has the second-largest number of TikTok users in the world, following the United States, with the number of users continuing to increase significantly. This study examines a model from a previous study to investigate the effects of technological affordances on flow experiences among TikTok users in Indonesia, with user experience level and video length as moderating variables. Based on flow theory, this study explores full engagement and enjoyment in digital activities. A quantitative approach using a cross-sectional survey was employed to collect data from 402 TikTok users in Indonesia. Structural Equation Modeling (SEM) was utilized to test the proposed research model. The analysis revealed that perceived recommendation serendipity emerged as the most potent driver of flow experience, followed by perceived recommendation accuracy. Conversely, perceived effortlessness and all proposed moderating effects—user experience level and video length—were found to be statistically insignificant. This study contributes theoretically by adapting flow theory to the localized digital dynamics of Indonesia and offers practical implications for developers to prioritize serendipitous discovery to enhance long-term user engagement.

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INTRODUCTION

TikTok became the most downloaded social media app in the United States just two years after its launch in 2016. Based on the time spent by users, TikTok has managed to beat social media giants such as Facebook and Instagram, as well as the YouTube video platform

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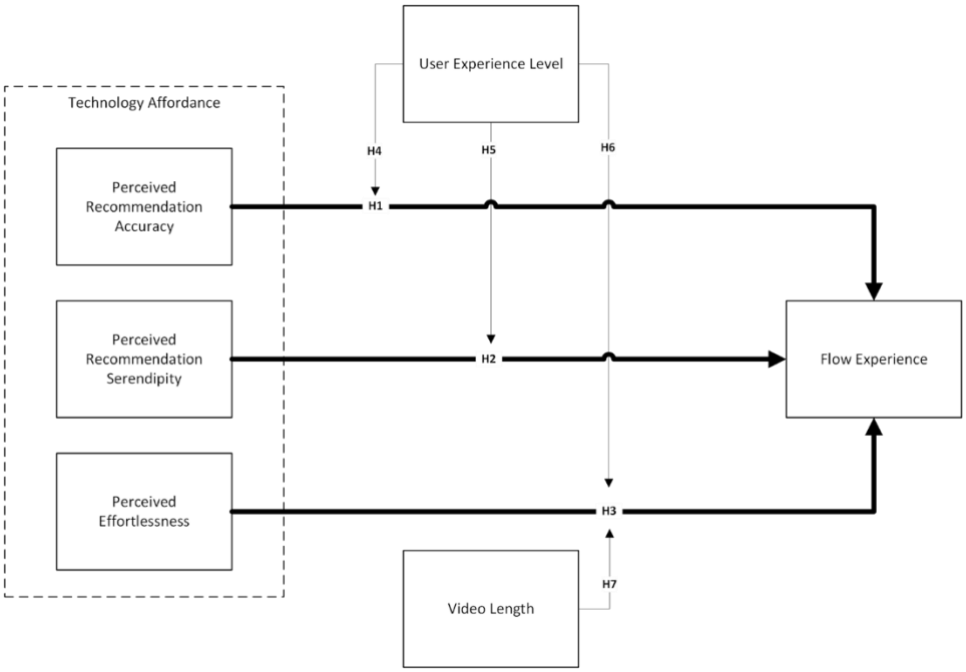
owned by Google, indicating very high user engagement (Zhao & Wagner, 2023). Research on TikTok users became popular after researchers recognized the success of this app, created by the Chinese company ByteDance, in generating high user engagement.

Researchers have conceptualized user engagement in computer-mediated environments using flow theory (Finneran & Zhang, 2005). In flow theory, flow experience is a feeling of total and complete engagement that a person experiences when performing an activity (Csikszentmihalyi, 1975). Furthermore, Csikszentmihalyi (1990) characterizes the experience of flow as a condition of loss of self-awareness, a feeling of internal pleasure, and a sense of potential control over the environment. This theory, which initially examined physical activity, later expanded to the digital and online realms (Finneran & Zhang, 2005).

Previous studies that have attempted to build models to uncover antecedents of flow experiences in the context of computer-mediated environments have been highly varied and inconsistent, depending on the specific research context (Valinatajbahnamiri & Siahtiri, 2021). This means that the findings from these studies cannot be directly used to identify the antecedents of flow experiences in the context of newer technological environments, such as users' experiences with TikTok (Zhao & Wagner, 2023).

Several previous studies have attempted to reveal the flow experience of TikTok users. Yang et al. (2023) examined self-referencing, vividness, and serendipity as antecedents of the flow experience. Qin et al. (2023) and Miranda et al. (2023) revealed the effect of flow experience on addiction to TikTok use. Zhao & Wagner (2023) used the concept of technological affordance as an antecedent of flow experience in TikTok.

Zhao & Wagner (2023) sought to build a model that can explain the antecedents of the flow experience on TikTok. The model was built using technology affordance theory to compile factors that can lead to flow experience in the context of using TikTok. In addition, this model considers other factors that can moderate the effect of technological affordance on the flow experience of TikTok users. User experience level, which is reflected in how long users have used TikTok and the video length recommended by TikTok to users, is considered to moderate the effect of technological affordance on the flow experience. Although the model proposed by Zhao & Wagner (2023) offers a solid foundation for explaining the relationship between technological affordances and flow experience, its generalizability across cultural and geographic contexts remains underexplored. Previous studies have shown that antecedents of flow often produce inconsistent findings due to strong contextual dependency. This study addresses this gap by replicating the model (see Figure 1) in Indonesia, a rapidly growing and culturally distinctive TikTok market, to assess whether local digital dynamics shape the technological affordances or whether they operate universally. Indonesia is particularly relevant given its position as the country with the second-largest TikTok user base globally (Kemp, 2024) and its collectivist socio-cultural orientation, where social interaction, content sharing, and participation in collective trends are central to digital identity. In such a context, perceived recommendation serendipity may exert a stronger emotional influence, making Indonesia a valuable non-Western setting for extending flow theory in social media research.



Source: Zhao & Wagner (2023)

Figure 1 Conceptual framework of the research

Consequently, this study aims to empirically investigate the effects of technological affordances—specifically, perceived recommendation accuracy, perceived recommendation serendipity, and perceived effortlessness—on the flow experience of TikTok users in Indonesia. Furthermore, the moderating roles of user experience level and video length in these relationships are explored. By achieving these objectives, this research intends to offer both theoretical contributions to the evolution of flow theory and practical insights for application developers to optimize user engagement in the Indonesian market.

In general, the flow experience is a feeling of being swept away or immersed in an activity that can manifest in the form of loss of self-awareness of the surrounding environment, maximum enjoyment, and loss of time orientation (Hsu et al., 2014; Miranda et al., 2023; Yang et al., 2023; Zhao & Wagner, 2023). The merging of actions and consciousness indicates that an individual is in a flow experience (Miranda et al., 2023). This study examines flow in the context of using social media, specifically TikTok. In this study, flow experience is defined as the feeling of being fully engaged and immersed in social media activities (Gao & Bai, 2014).

In relation to technological affordances, Zhao & Wagner (2023) revealed that the concept of affordances was first proposed by Gibson (1986), which explains the possibilities provided or offered by an environment to us. Mao (2014) revealed that the interaction between users and tools can be a determinant that must be considered in the process of forming attitudes towards the use of technology. Shao et al. (2020) argued that when a technology is used, it is aligned with a set of affordances that can shape users' perceptions of the nature of content in certain media.

The first dimension of technological affordances formulated by Zhao & Wagner (2023) is perceived recommendation accuracy. This relates to TikTok's intelligent recommendation

system, which automatically serves content to users through the accuracy of its recommendation algorithm. Content recommendations are important because the main goal of TikTok users is to find content that interests them (Ceci, 2022). A recommendation system collects and analyzes user preferences, both explicit and implicit, and the results become personalized recommendations (Li & Karahanna, 2015). Yang et al. (2023) added that well-implemented algorithmic recommendations on short video platforms can accurately and efficiently push video content that is of interest to users. Users will pay more attention to the content when it matches their preferences (Ma et al., 2021). In other words, the more accurate the content recommendations, the higher the user's concentration and enjoyment, which will trigger the flow experience. Therefore, the first hypothesis (H1) is that perceived recommendation accuracy is positively associated with flow experience.

Regarding the second dimension, perceived recommendation serendipity, videos on TikTok are presented randomly without end and without knowing what kind of video will appear afterward. McCay-Peet & Toms (2015) emphasize the importance of facilitating serendipity in the form of perceptions of captivating coincidences, luck, or accidental discoveries. Zhao & Wagner (2023) expressed this uncertainty as something that is likely to generate surprise and excitement. In line with this statement, Yang et al. (2023) revealed that it will not only help users reduce the filter bubble but also arouse their curiosity and pleasure, thus increasing their engagement. Based on this explanation, it is expected that recommendation serendipity can contribute in generating users' flow experience. Therefore, the second hypothesis (H2) is that perceived recommendation serendipity is positively associated with flow experience.

Perceived effortlessness is the next dimension. Allam et al. (2020) revealed that the perceived ease of use of a tool is defined as the extent to which a person considers that using a particular tool will be free from effort. Gao & Bai (2014) stated that users' perceptions of the ease of an application contribute to and positively influence their flow experience. Zhao & Wagner (2023) explained that this perceived effortlessness affects the user's flow experience because easy application operation allows users to concentrate on the content. From this explanation, the third hypothesis (H3) is that perceived effortlessness is positively associated with flow experience.

One of the moderating factors used in this model is the user experience level. Valinatajbahnamiri & Siahtiri (2021) revealed that the experience of flow in a computer-mediated environment is not a condition that can be measured equally in each individual. Referring to Zhao & Wagner (2023), this study takes the construct of user experience level as a relevant moderator to show the effect of individual dynamic experience on flow experience. As the level of user experience increases, the effect of perceived recommendation accuracy on the flow experience is expected to weaken because the same content will be repeated. Conversely, Zhao & Wagner (2023) revealed that the level of user experience strengthens the relationship between perceived recommendation serendipity and flow experience. Regarding the effect of user experience level on perceived effortlessness, Lu & Lee (2012) stated that perceived effortlessness is considered more relevant and important for novice users than

experienced ones. Based on the moderating factors discussed above, the following hypotheses have been developed: (H4) user experience level weakens the relationship between perceived recommendation accuracy and flow experience; (H5) user experience level strengthens the relationship between perceived recommendation serendipity and flow experience; and (H6) user experience level weakens the relationship between perceived effortlessness and flow experience.

TikTok is famous for its short video format. Zhao & Wagner (2023) suggested that video length should be considered as a factor related to the context of user flow experience. Zhao & Wagner (2023) argued that shorter videos tend to decrease users' perception of the app's ease of use, as users will require more effort in navigating when selecting and consuming these contents. Based on these assumptions, the seventh hypothesis (H7) is that video length weakens the relationship between perceived effortlessness and flow experience.

RESEARCH METHOD

This study uses a quantitative approach in accordance with the research objectives that test the relationship between variables. This approach allows researchers to empirically measure influences and test hypotheses (Gómez-Rico et al., 2023). The method used is a cross-sectional survey. Valinatajbahnamiri & Siahtiri (2021) conducted a literature review related to flow in a computer-mediated environment and found that the majority of data collection conducted in similar studies used a cross-sectional design.

According to Hair et al. (2009), determining the target population is one of the key factors in achieving research objectives by determining groups of participants or respondents who have similar or the same characteristics, interests, or experiences. Considering the research objectives, the target population in this study is TikTok users in Indonesia. The sampling technique is non-probability sampling. The use of non-probability sampling considers the unavailability of a sampling frame in the form of data of all TikTok users in Indonesia. The sample selection technique used in this study is convenience sampling with the criteria for potential respondents referring to the target population, which is TikTok users in Indonesia. To ensure that the sample matches the target population, one pre-qualification question is given, which is, "do you use TikTok app?".

The target sample size is calculated using the sample size calculator (Calculator.net, 2024). For a large target population whose number is unknown, with a confidence level of 95%, a margin of error of 5%, and a population proportion of 50%, the minimum number of samples required is 385. Nevertheless, the target sample size for this study was set at 400.

The instrument used in this study was replicated from Zhao & Wagner (2023) with some adjustments. The instrument consists of 6 constructs and 15 indicators. The constructs used include flow, perceived recommendation accuracy, perceived recommendation serendipity, perceived effortlessness, user experience level, and video length. To measure the constructs, each statement presented to respondents is accompanied by an answer choice using a seven-level Likert scale. The Likert scale can be used to examine perceptions, attitudes, and opinions,

as has been used in previous studies (Brailovskaia & Teichert, 2020; Miranda et al., 2023; Qin et al., 2023; Zhao & Wagner, 2023).

Several modifications were made to the indicators that need to be adjusted based on the results of the tests conducted. The first stage of this study was to translate the English questionnaire instrument into Indonesian. This translation process was conducted because the respondents were Indonesian citizens who used Indonesian as their daily language. Furthermore, the rewording stage was conducted on the indicators in the questionnaire by asking several prospective respondents regarding the clarity and ease of the language used in the instrument. The rewording results show that several words need to be changed to make it easier for respondents to understand the meaning of the indicators being asked. For example, the indicator regarding the sense of 'surprise' was adjusted from a literal translation "*terkejut*" to a phrase describing the discovery of unexpected interesting content to prevent respondents from misinterpreting the term as a negative or startling shock, thereby ensuring that the construct accurately captured the positive serendipitous experience. Rewording of research instruments is a process also carried out by previous studies (Cao et al., 2020; Kim et al., 2017) to ensure that the instruments used are in accordance with the respondents' understanding and research needs.

Table 1 Demographics Information of the Respondents

Item	Options	Frequency and Ratio	
		N	%
Gender	Men	142	35.32
	Women	260	64.68
Age	Under 18 years old	6	1.49
	18-24 years old	238	59.20
	25-34 years old	122	30.35
	35-44 years old	27	6.72
	45-54 years old	9	2.24
	55 years and above	0	0
Education Level	Under high school	2	0,50
	SMA/SMK	48	11,94
	Bachelor/Diploma	326	81.09
	Master	25	6.22
	Doctorate and above	1	0.25
Employment Status	Full-time Workers	187	46.52
	Part-time Workers	62	15.42
	Not Working	46	11.44
	Retirement	0	0
	Students	107	26.62

Before collecting the main data, two pilot studies or pre-tests of the research instrument were conducted. A sample of 10% of the number of respondents in the main study was used and was considered sufficient to conduct the pre-test (Connelly, 2008). The final pre-test results showed that all variables met the internal reliability criteria, with Cronbach's alpha values above 0.7. Next, the main data collection was conducted using an online questionnaire instrument through a link distributed on various instant messaging applications, such as WhatsApp, Telegram, Instagram direct messages, and Line. Data were collected by self-report by respondents. No incentives were promised to respondents, so all data filling was done voluntarily.

The survey was conducted from November 8, 2024 to November 20, 2024. Data were obtained from 427 respondents from the results of distributing questionnaires. Manual screening of the data revealed that 25 individuals did not complete the consent form and, therefore, did not qualify for inclusion in the study. After reducing invalid data, a total of 402 respondents (see Table 1) identified as the final data to be analyzed.

To ensure the quality of the collected data, the measurement model was evaluated based on several statistical criteria. Reliability was assessed using Cronbach's alpha and composite reliability (CR), with a required threshold of 0.7 to indicate internal consistency (Hair et al., 2019). For validity, convergent validity was confirmed if factor loadings exceeded 0.7 and the average variance extracted (AVE) was above 0.5 (Hair et al., 2019). Additionally, discriminant validity was monitored using the Heterotrait-Monotrait Ratio (HTMT), ensuring that all values remained below the 0.9 threshold (Henseler et al., 2016).

RESULTS AND DISCUSSION

To test the measurement model, structural model, and hypotheses, the partial least squares (PLS) method was employed using SmartPLS software version 3.0. PLS was chosen because this study aims to test the model developed by Zhao & Wagner (2023), which is the development of a theoretical framework by adding new paths (moderating variables). To test the measurement model, validity and reliability tests were conducted.

As shown in Table 2, the factor loading of all indicators exceeds the 0.7 threshold, indicating good convergent validity (Hair et al., 2019). The AVE value of each construct in this study also exceeded the 0.5 threshold, indicating good validity of the measurement model (Hair et al., 2019). Furthermore, discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT). As shown in Table 3, the HTMT value of each pair of constructs is below the 0.9 threshold, indicating good discriminant validity (Hair et al., 2019). To assess reliability, Cronbach's alpha, rho_A, and composite reliability values were calculated for each construct. As shown in Table 2, all values exceeded the 0.7 threshold, indicating that all constructs had good reliability (Hair et al., 2019).

Furthermore, to avoid biased results caused by self-report data collection, a common method bias test was conducted. Referring to Kock (2015), common method bias can be measured using the variance inflation factor (VIF) value of the inner model. All constructs have

VIF values lower than the 3.3 threshold, indicating that the model is free from common method bias problems.

Table 2 Validity and Reliability Test Results

Construct	Indicator/ Items	Factor loadings	Cronbach's alpha	Composite reliability	rho_A	AVE
Perceived recommendation accuracy (PRA)	PRA1	0.91	0.88	0.92	0.88	0.81
	PRA2	0.90				
	PRA3	0.88				
Perceived recommendation serendipity (PRS)	PRS1	0.85	0.86	0.91	0.88	0.72
	PRS2	0.87				
	PRS3	0.91				
	PRS4	0.74				
Perceived effortlessness (PE)	PE1	0.95	0.80	0.90	0.97	0.82
	PE2	0.86				
Flow experience (FE)	FE1	0.82	0.85	0.90	0.88	0.69
	FE2	0.77				
	FE3	0.84				
	FE4	0.88				

Before testing the structural relationship between constructs, collinearity was checked by examining the outer variance inflation factor (VIF) of the predictor constructs. The results showed a value below 5, indicating that there is no collinearity problem (Hair et al., 2019). Furthermore, a model fit test was conducted using the Standardized Root Mean Square Residual (SRMR). The measurement results show an SRMR value of 0.068, which is adequate for the PLS path model (Henseler et al., 2016).

Table 3 HTMT Test Results

Variables	Flow Experience (FE)	Perceived Effortlessness (PE)	Perceived Recommendation Serendipity (PRS)
Flow Experience (FE)			
Perceived Effortlessness (PE)	0.297		
Perceived Recommendation Serendipity (PRS)	0.459	0.426	
Perceived Recommendation Accuracy (PRA)	0.383	0.473	0.507

The model evaluation in this study refers to the research of Zhao & Wagner (2023) using the R^2 value which can describe the model's explanatory power (Hair et al., 2019). Based on the test results, the R^2 value of the tested model is 0.289 (see Figure 2). This value indicates that 28.9% of the flow experience can be explained by the independent variables in this model, whereas the remaining 71.1% is influenced by other factors not examined in this study. Referring to Hair et al. (2019), the explanatory power of this model is in the low category.

Hypothesis testing is performed by examining the statistical significance value (p value) and path coefficients. As shown in Table 4, flow experience is significantly influenced by perceived recommendation accuracy (ß = 0.155, p < 0.005), so H1 is supported. The test results also show that perceived recommendation serendipity significantly influences the flow experience (ß = 0.278, p < 0.000), therefore H2 is also supported. Regarding perceived effortlessness, the test results show no significant association with flow experience (ß = 0.057, p > 0.005), therefore H3 is rejected.

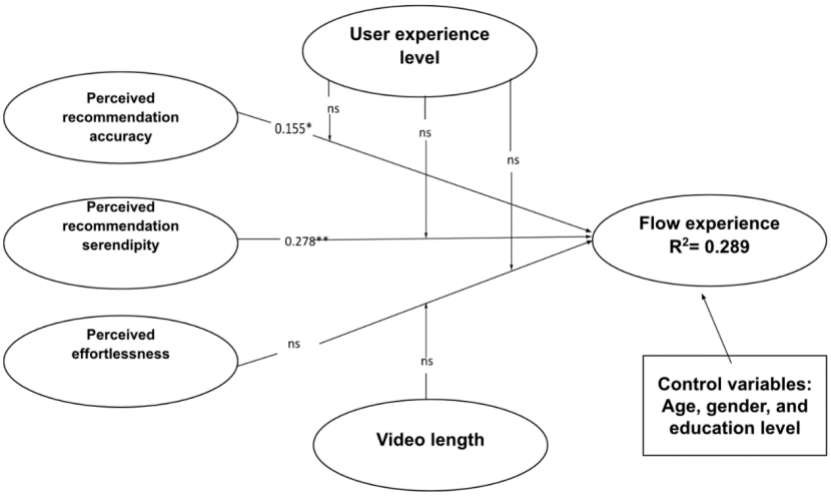
To test the moderating effect of user experience level and video length, the same test was conducted as for the independent variables in this model. The test results show that user experience level is not significant in moderating the effects of perceived recommendation accuracy on flow experience (ß = 0.002, p > 0.05), perceived recommendation serendipity on flow experience (ß = -0.030, p > 0.05), and perceived effortlessness on flow experience (ß = 0.042, p > 0.05). Therefore, H3, H4, and H5 are not supported by the sample data of this study and are rejected.

Table 4 Hypothesis Test Results

	Hypothesis			Path Coefficient (ß)	*p values*	Description
H1	PRA	→	FE	0.155	0.007	Supported
H2	PRS	→	FE	0.278	0.000	Supported
H3	PE	→	FE	0.057	0.254	Rejected
Moderation analysis						
H4	UEL * PRA	→	FE	0.020	0.742	Rejected
H5	UEL * PRS	→	FE	-0.030	0.594	Rejected
H6	UEL*PE	→	FE	0.042	0.434	Rejected
H7	VL*PE	→	FE	-0.019	0.637	Rejected

Notes: PRA = *Perceived Recommendation Accuracy;* PRS = *Perceived Recommendation Serendipity;* PE = *Perceived Effortlessness;* UEL = *User Experience Level;* VL = *Video Length*

The test results also show that video length is not significant in moderating the effect of perceived effortlessness on flow experience (ß = -0.019, p > 0.05), therefore H7 is also rejected. Overall, the structural model test results and hypothesis test results can be seen in Figure 2.



Notes: *p<0.05; **p<0.01; ns = *not supported*

Figure 2 Structural Model and Hypothesis Test Results

This study is a critical replication and contextual extension of flow theory and technology affordance concept within the short-video social media landscape. Specifically, it tests the conceptual model proposed by Zhao & Wagner (2023) to determine its cross-cultural applicability in Indonesia. By focusing on Indonesian TikTok users, this study validates the theoretical boundaries of how algorithmic affordances, such as recommendation accuracy and serendipity, act as psychological triggers for deep user immersion.

Our findings reinforce the work of Zhao & Wagner (2023) and Yang et al. (2023) by confirming that content-related affordances are the primary drivers of flow in computer-mediated environments. However, this study explicitly differentiates itself by revealing that the ease of use (perceived effortlessness) and demographic moderators, which were significant in Western-centric models, do not hold the same weight in the Indonesian context. This positions the research as a bridge between generalized technology models and localized digital behaviors, suggesting that flow on TikTok is more influenced by content surprise (serendipity) and relevance (accuracy) than by technical simplicity or user experience level.

The statistical test results show that perceived recommendation serendipity has the strongest effect (ß = 0.278) on the flow experience on TikTok. This illustrates that the aspect of unexpected content recommendations has the greatest contribution in making users feel flow. This also corroborates the results of a previous study (Yang et al., 2023) that revealed that unexpected information and content recommendations can provoke curiosity, excitement, and ultimately make users immersed in feelings of flow when consuming content on social media applications. In the Indonesian context, cultural orientations, such as collectivism and social connectivity, heighten the impact of perceived recommendation serendipity, as discovering viral or community-relevant content allows users to feel socially in-sync with prevailing trends. As noted by Asakawa (2010), cultural contexts dictate how individuals perceive and achieve flow experiences. For Indonesians, the joy of discovery (serendipity) is amplified by the potential for social interaction and collective engagement. This explains why serendipitous

recommendations, which often mirror localized social movements, serve as the strongest driver of flow in this study.

Perceived effortlessness is the only variable included in technology affordances that has not been proven to influence the flow experience. This finding is possible because the main purpose of people accessing TikTok is to consume content (Ceci, 2022). In addition, the majority of the sample data in this study fall into the age range of 18-34 years old; thus, they are categorized as digital natives (Ng, 2012) who are already accustomed to using applications and technology. Moreover, the majority of the respondents in this study already have experience using TikTok for more than one year (80.84%%), meaning that they are already familiar with using the menu and features in TikTok so that there is no longer an impact on user experience or flow experience.

The two moderator variables tested in this study showed insignificant p-values in moderating the effect of the three technology affordances variables on flow experience. This finding differs from the results of Zhao & Wagner (2023), where the hypotheses predicting the moderating effect of user experience level and video length were supported. This finding shows that there are other variables that are considered more powerful in influencing the experience of flow in computer-mediated environments (Valinatajbahnamiri & Siahtiri, 2021), including individual personal traits such as self-confidence (Kim et al., 2017), mindfulness when using applications (Mazzoni et al., 2017), procrastination in decision making (Zanjani et al., 2016), and the need for knowledge (D. Li & Browne, 2006). Additionally, societal factors such as the influence of active parental care (Qin et al., 2023) and internalized cultural values (Asakawa, 2010) should be considered for inclusion in the model when seeking moderating effects on the flow experience. In the Indonesian context, collectivistic culture and a high degree of social connectivity likely influence how technological affordances trigger immersion. For Indonesian users, flow may not be a purely solitary state but a socially-shared experience. This cultural orientation potentially moderates the impact of perceived recommendation serendipity; the discovery of unexpected content becomes more immersive when it aligns with localized viral trends, allowing users to fulfill a sense of social belonging.

Meanwhile, the difference in hypothesis testing results related to the moderating effect of the video length variable is thought to be caused by the insignificant difference in duration between one content and another in the TikTok application. The survey data show that the majority of respondents (92.04%) consume content with a duration of under three minutes. Previous research (Guo et al., 2014; Verma et al., 2021) has shown that users tend to be more sensitive to the type of content if the duration of the videos offered varies significantly. Referring to this research, the video length factor will have a more visible impact in moderating the flow experience when applied to the context of a content provider platform with more significant duration variations, such as the YouTube platform.

The Adjusted R^2 value or explanatory power obtained through statistical tests shows that the category of variance strength in the dependent variable is low (0.289). This value is lower than the result of study by Zhao & Wagner (2023) in the moderate category (0.415). Measurements of human behavior conducted by social science studies often produce

explanatory power values below 0.5. This is due to the difficulty in accurately predicting human behavior (Zhao & Wagner, 2023). Meanwhile, based on the model fit test, this study found that the model built met the main test criteria using Standardized Root Mean Squared Residual (SRMR). This value indicates that the model has an adequate level of fit in representing empirical data.

Theoretical contributions or implications are offered in this research. First, this study contributes to the development of flow theory within the context of TikTok short video-based social media users in Indonesia. So far, flow theory in the digital world has been dominated by research on online games (Lee & Tsai, 2010; Sepehr & Head, 2018), e-commerce applications (Lee et al., 2019), and other digital activities (Skadberg & Kimmel, 2004). These studies depart from the assumption that the experience of flow requires deep engagement to achieve its optimal state in the digital world (Hoffman & Novak, 2009). Many studies have brought flow theory into the context of social media (Berezan et al., 2018; Gao & Bai, 2014; Kwak et al., 2014; Lu & Cheng, 2020; Pelet et al., 2017), but, few have specifically offered the use of TikTok as a research context. In fact, the development of new technologies is the basic reason for the need for further research in the context of social media platforms based on algorithm technology designed for fast content consumption. Therefore, the data findings from this study show how users' perceptions of TikTok content recommendations' accuracy and unpredictability affect the flow experience. These findings are consistent with previous findings (Zhao & Wagner, 2023) that extend the scope of flow theory to TikTok users.

This research also contributes to the development of content recommendation concepts and algorithm technology. So far, most studies (Cao et al., 2020; H. Zhang et al., 2014, 2018; Q. Zhang et al., 2024) have focused on the issue of content recommendation accuracy. In fact, too rigid content recommendations based on preference algorithms and repetition of the same type of content recommendations tend to cause boredom in the audience and narrow users' exposure to diverse perspectives. As explained in the concept of serendipity (McCay-Peet & Toms, 2015), the findings of this study are consistent with those of previous research (Zhao & Wagner, 2023) that states that content recommendations by serendipity influence the flow experience of social media users. Serendipity allows users to discover unexpected yet relevant content, thus encouraging further engagement without losing the fun element of exploration (Lu & Cheng, 2020). The findings on this concept add to the long list of antecedents considered to enhance users' flow experience in the context of technological affordances research.

The findings of this study provide input for practitioners in building social media platforms based on short video content. This research shows that the same technological features, both in terms of recommendation algorithms and ease of navigation, do not necessarily have the same impact on users' flow experience. This can be seen from the results of the study, which show that the perceived ease of the TikTok application does not have a significant impact on the user's flow experience. New feature development is needed by re-identifying the needs of audiences from different backgrounds to continue optimizing existing features to improve user experience, including recommendation features and content selection navigation.

In this study, both accuracy and serendipity of recommendation had an impact on users' flow experience. Empirically, the results of this study also show greater significance for serendipity recommendations than for accuracy recommendations. Therefore, short video platform developers can continue to develop the user experience (UX) of their apps to further strengthen serendipity recommendations by maximizing artificial intelligence (AI)-based technologies. By focusing more on serendipity recommendations, platform developers are expected to provide a wider range of recommendation types by including content that users may find unexpected but still relevant to their interests. As Zhao & Wagner (2023) show, social media will tend to get a bad reputation or negative response if they let users self-select their favorite content from a long list of content options, rather than directly serving content that has been selected by the application provider based on user preference algorithms. This more personalized and unexpected experience of social media platforms is expected to increase loyalty and make users feel more personally connected (Gómez-Rico et al., 2023; Yang et al., 2023).

This study has several limitations. First, as a replication study, the present work was limited to examining the existing model and was unable to identify other variables that may be relevant and affect the flow experience in the TikTok context. Second, the sample selection technique in the study is non-probability (convenience sampling), so it has limitations in generalizing the results. Third, the data collection technique in this study uses self-report, which is voluntary, and respondents are not given anything in return. This has the potential to lead to bias in the findings.

It is recommended that future research develop the model built by Zhao & Wagner (2023) using a different theoretical lens to identify additional factors that may contribute to improving the flow experience among TikTok users. It is also recommended that future research expand the scope of the current study by examining the flow experience of TikTok users in different cultural contexts, utilizing probability sampling techniques to enhance the generalizability of the results.

CONCLUSION

From the results of this study, it can be concluded that the model examined in this study, regarding the effect of technological affordance on the flow experience moderated by the level of user experience and video duration, has different result when applied in the context of TikTok users in Indonesia. The statistical test results show that two of the three technological affordance factors—perceived recommendation accuracy and perceived recommendation serendipity—are proven to be influential in generating optimal flow experiences. Meanwhile, perceived effortlessness and two moderating variables—user experience level and video length—did not exhibit a significant effect. Therefore, further model development and studies are needed to confirm the findings of this study and to identify other variables that can moderate the effect of technological affordance on the flow experience in the context of using TikTok.

REFERENCES

Allam, H., Bliemel, M., Ali-Hassan, H., Blustein, J., & Spiteri, L. (2020). If you build it, they won't come: What motivates employees to create and share tagged content: A theoretical model and empirical validation. *International Journal of Information Management*, 54, 102148. https://doi.org/10.1016/j.ijinfomgt.2020.102148

Asakawa, K. (2010). Flow experience, culture, and well-being: How do autotelic Japanese college students feel, behave, and think in their daily lives? *Journal of Happiness Studies*, 11(2), 205–223. https://doi.org/10.1007/s10902-008-9132-3

Berezan, O., Krishen, A. S., Agarwal, S., & Kachroo, P. (2018). The pursuit of virtual happiness: Exploring the social media experience across generations. *Journal of Business Research*, 89, 455–461. https://doi.org/10.1016/j.jbusres.2017.11.038

Brailovskaia, J., & Teichert, T. (2020). "I like it" and "I need it": Relationship between implicit associations, flow, and addictive social media use. *Computers in Human Behavior*, 113. https://doi.org/10.1016/j.chb.2020.106509

Calculator.net. (2024). *Sample size calculator*. https://www.calculator.net/sample-size-calculator.htm

Cao, X., Gong, M., Yu, L., & Dai, B. (2020). Exploring the mechanism of social media addiction: an empirical study from WeChat users. *Internet Research*, 30(4), 1305–1328. https://doi.org/10.1108/INTR-08-2019-0347

Ceci, L. (2022). Mains reasons for TikTok usage according to users from the United States and United Kingdom as of June 2020. *Statista*. https://www.statista.com/statistics/1179080/tiktok-reasons-use-app/

Connelly, L. M. (2008). Pilot studies. Medsurg Nursing : Official Journal of the Academy of Medical-Surgical Nurses, 17(6), 411–412. https://doi.org/10.1145/3081016.3081020

Csikszentmihalyi, M. (1975). *Beyond Boredom and Anxiety*. Jossey-Bass Inc.

Csikszentmihalyi, M. (1990). *Flow: The Psychology of Optimal Experience*. HarperCollins.

Finneran, C. M., & Zhang, P. (2005). Flow in computer-mediated environments: Promises and challenges. *Communications of the Association for Information Systems*, 15(15), 82–101. http://aisel.aisnet.org/cais%5Cnhttp://aisel.aisnet.org/cais/vol15/iss1/4

Gao, L., & Bai, X. (2014). An empirical study on continuance intention of mobile social networking services: Integrating the IS success model, network externalities and flow theory. *Asia Pacific Journal of Marketing and Logistics*, 26(2), 168–189. https://doi.org/10.1108/APJML-07-2013-0086

Gibson, J. J. (1986). *The Ecological Approach to Visual Perception*. Psychology Press.

Gómez-Rico, M., Santos-Vijande, M. L., Molina-Collado, A., & Bilgihan, A. (2023). Unlocking the flow experience in apps: Fostering long-term adoption for sustainable healthcare systems. *Psychology and Marketing*, 40(8), 1556–1578. https://doi.org/10.1002/mar.21824

Guo, P. J., Kim, J., & Rubin, R. (2014). How video production affects student engagement: An empirical study of MOOC videos. *L@S 2014 - Proceedings of the 1st ACM Conference on Learning at Scale*, 41–50. https://doi.org/10.1145/2556325.2566239

Hair, J. F., Black, W. C., Babin, B. B. J., & Anderson, R. E. (2009). *Multivariate Data Analysis*. Prentice Hall.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Henseler, J., Hubona, G., & Ray, P. A. (2016). Using PLS path modeling in new technology research: Updated guidelines. *Industrial Management and Data Systems*, 116(1), 2–20. https://doi.org/10.1108/IMDS-09-2015-0382

Hoffman, D. L., & Novak, T. P. (2009). Flow Online: Lessons Learned and Future Prospects. *Journal of Interactive Marketing*, 23(1), 23–34. https://doi.org/10.1016/j.intmar.2008.10.003

Hsu, C. L., Yu, C. C., & Wu, C. C. (2014). Exploring the continuance intention of social networking websites: An empirical research. *Information Systems and E-Business Management*, 12(2), 139–163. https://doi.org/10.1007/s10257-013-0214-3

Kemp, S. (2024). *Digital 2024: Indonesia*. Data Reportal – Global Digital Insights. https://datareportal.com/reports/digital-2024-indonesia

Kim, M. J., Lee, C. K., & Bonn, M. (2017). Obtaining a better understanding about travel-related purchase intentions among senior users of mobile social network sites. *International Journal of Information Management*, 37(5), 484–496. https://doi.org/10.1016/j.ijinfomgt.2017.04.006

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of E-Collaboration*, 11(4), 1–10. https://doi.org/10.4018/ijec.2015100101

Kwak, K. T., Choi, S. K., & Lee, B. G. (2014). SNS flow, SNS self-disclosure and post hoc interpersonal relations change: Focused on Korean Facebook user. *Computers in Human Behavior*, 31(1), 294–304. https://doi.org/10.1016/j.chb.2013.10.046

Lee, M.-C., & Tsai, T.-R. (2010). What drives people to continue to play online games? An extension of technology model and theory of planned behavior. *International Journal of Human-Computer Interaction*, 26(6), 601–620. https://doi.org/10.1080/10447311003781318

Lee, Y. J., Ha, S., & Johnson, Z. (2019). Antecedents and consequences of flow state in e-commerce. *Journal of Consumer Marketing*, 36(2), 264–275. https://doi.org/10.1108/JCM-10-2015-1579

Li, D., & Browne, G. J. (2006). The role of need for cognition and mood in online flow experience. *Journal of Computer Information Systems*, 46(3), 11–17. http://dx.doi.org/10.1016/j.jaci.2012.05.050

Li, S. S., & Karahanna, E. (2015). Online recommendation systems in a B2C E-commerce context: a review and future directions. *Journal of the Association for Information Systems*, 16(2), 2. https://doi.org/10.17705/1jais.00389

Lu, H. P., & Cheng, Y. H. (2020). Sustainability in online video hosting services: The effects of serendipity and flow experience on prolonged usage time. *Sustainability*, 12(3). https://doi.org/10.3390/su12031271

Lu, H. P., & Lee, M. R. (2012). Experience differences and continuance intention of blog sharing. *Behaviour and Information Technology*, 31(11), 1081–1095. https://doi.org/10.1080/0144929X.2011.611822

Ma, Y., Cao, Y., Li, L., Zhang, J., & Clement, A. P. (2021). Following the flow: Exploring the impact of mobile technology environment on user's virtual experience and behavioral response. *Journal of Theoretical and Applied Electronic Commerce Research*, 16(2), 170–187. https://doi.org/10.4067/S0718-18762021000200112

Mao, J. (2014). Social media for learning: A mixed methods study on high school students' technology affordances and perspectives. *Computers in Human Behavior*, 33, 213–223. https://doi.org/10.1016/j.chb.2014.01.002

Mazzoni, E., Cannata, D., & Baiocco, L. (2017). Focused, not lost: The mediating role of temporal dissociation and focused immersion on problematic internet use. *Behaviour and Information Technology*, 36(1), 11–20. https://doi.org/10.1080/0144929X.2016.1159249

McCay-Peet, L., & Toms, E. G. (2015). Investigating serendipity: How it unfolds and what may influence it. *Journal of the Association for Information Science and Technology*, 66(7), 1463–1476. https://doi.org/10.1002/asi.23273

Miranda, S., Trigo, I., Rodrigues, R., & Duarte, M. (2023). Addiction to social networking sites: Motivations, flow, and sense of belonging at the root of addiction. *Technological Forecasting and Social Change*, 188. https://doi.org/10.1016/j.techfore.2022.122280

Ng, W. (2012). Can we teach digital natives digital literacy? *Computers and Education*, 59(3), 1065–1078. https://doi.org/10.1016/j.compedu.2012.04.016

Pelet, J. É., Ettis, S., & Cowart, K. (2017). Optimal experience of flow enhanced by telepresence: Evidence from social media use. *Information and Management*, 54(1), 115–128. https://doi.org/10.1016/j.im.2016.05.001

Qin, Y., Musetti, A., & Omar, B. (2023). Flow experience is a key factor in the likelihood of adolescents' problematic TikTok use: The moderating role of active parental mediation. *International Journal of Environmental Research and Public Health*, 20(3). https://doi.org/10.3390/ijerph20032089

Sepehr, S., & Head, M. (2018). Understanding the role of competition in video gameplay satisfaction. *Information and Management*, 55(4), 407–421. https://doi.org/10.1016/j.im.2017.09.007

Shao, Z., Zhang, L., Chen, K., & Zhang, C. (2020). Examining user satisfaction and stickiness in social networking sites from a technology affordance lens: uncovering the moderating effect of user experience. *Industrial Management and Data Systems*, 120(7), 1331–1360. https://doi.org/10.1108/IMDS-11-2019-0614

Skadberg, Y. X., & Kimmel, J. R. (2004). Visitors' flow experience while browsing a Web site: Its measurement, contributing factors and consequences. *Computers in Human Behavior*, 20(3), 403–422. https://doi.org/10.1016/S0747-5632(03)00050-5

Valinatajbahnamiri, M., & Siahtiri, V. (2021). Flow in computer-mediated environments: A systematic literature review. *International Journal of Consumer Studies*, 45(4), 511–545. https://doi.org/10.1111/ijcs.12640

Verma, G., Nalamada, T., Harpavat, K., Goel, P., Mishra, A., & Srinivasan, B. V. (2021). Non-linear consumption of videos using a sequence of personalized multimodal fragments. *International Conference on Intelligent User Interfaces, Proceedings IUI*, 249–259. https://doi.org/10.1145/3397481.3450672

Yang, H., Zhang, S., Diao, Z., & Sun, D. (2023). What motivates users to continue using current short video applications? A dual-path examination of flow experience and cognitive lock-in. *Telematics and Informatics*, 85, 102050. https://doi.org/10.1016/j.tele.2023.102050

Zanjani, S. H. A., Milne, G. R., & Miller, E. G. (2016). Procrastinators' online experience and purchase behavior. *Journal of the Academy of Marketing Science*, 44(5), 568–585. https://doi.org/10.1007/s11747-015-0458-1

Zhang, H., Lu, Y., Gupta, S., & Zhao, L. (2014). What motivates customers to participate in social commerce? the impact of technological environments and virtual customer experiences. *Information and Management*, 51(8), 1017–1030. https://doi.org/10.1016/j.im.2014.07.005

Zhang, H., Zhao, L., & Gupta, S. (2018). The role of online product recommendations on customer decision making and loyalty in social shopping communities. *International Journal of Information Management*, 38(1), 150–166. https://doi.org/10.1016/j.ijinfomgt.2017.07.006

Zhang, Q., Wang, Y., & Ariffin, S. K. (2024). Keep scrolling: An investigation of short video users' continuous watching behavior. *Information and Management*, 61(6), 104014. https://doi.org/10.1016/j.im.2024.104014

Zhao, H., & Wagner, C. (2023). How TikTok leads users to flow experience: investigating the effects of technology affordances with user experience level and video length as moderators. *Internet Research*, 33(2), 820–849. https://doi.org/10.1108/INTR-08-2021-0595