

Original Research

Factors Affecting Interactive-Storytelling Contents Usage: Exploring the Roles of Perceived Interaction, Innovation, Usage Pattern, and Device Type

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ABSTRACT

In this study, we investigate the effect of perception and experience within Interactive Storytelling Content (ISC), a content type, on user flow experience, satisfaction, and intention to continue using ISC. We consider perceived interaction, perceived attributes of innovations, and usage patterns as types of independent variables. We classify respondents with experience using ISC into a non-portable devices-centered user group and a portable devices-centered user group, depending on their preferred device types. We examined the perceived interaction related to ISC and Identified Person to Person (P2P), Person to Computer (P2C), and Person to Storytelling (P2S) interaction. We found out that P2P and P2S interaction influences are confirmed, and all variables in perceived attributes of innovations have a significant influence. The number of ISCs watched and the duration of Netflix subscriptions affect some dependent variables. Findings suggest that over-the-top (OTT) services, delivering content and media over the Internet rather than traditional cable, offer users an interaction experience and should provide different values for each device.

KEYWORDS

interactive storytelling content, perceived interaction, innovation, usage pattern, device type

Interactive technology has also been applied to traditional video storytelling content, such as TV series, films, and animation. An emerging form of interactive content is Interactive Storytelling Content (ISC). ISC is video content in which users create a narrative while making decisions on behalf of the main characters who appear in the content (Netflix, 2020). Like Netflix, ISC is being offered by major global OTT services. Netflix's first ISC is *Puss in Book: Trapped in an Epic Tale*, released in 2017, but two years later, the company raised its

ISC reputation by releasing *Bandersnatch* as a spinoff of its famous original content *Black Mirror* (Elnahla, 2019). As of September 2020 (Netflix, 2020), Netflix had already released nine ISCs.

The expansion of technological infrastructure, such as the proliferation of User Interfaces (UI)-equipped devices (Abreu et al., 2017), the growth of online streaming video platforms, and the adoption of high-speed networks like 5G, have facilitated the development of ISC. Reflecting this, *Bandersnatch* won the award for Outstanding Television Movie at the 71st Emmy Awards, demonstrating the potential for commercial success of ISC (Television Academy, 2020). Netflix has made it clear that it will produce even more ISCs in the future, fueled by *Bandersnatch*'s success (Shieber, 2019).

With the expansion of ISC on the online platform, users' perceptions and behaviors of ISC are of great interest, both theoretically and practically. These mainly include marketing elements (Elnahla, 2019), aesthetic characteristics (Monteiro, 2020), and studies analyzing the characteristics of *Bandersnatch* by a game-analysis method (de Vries, 2019). They have largely taken the primary approach of case analysis for ISC, while rarely conducting quantitative analysis. Some studies have explored users' perceptions of ISC but they only included users in their twenties and did not propose variables that reflect the characteristics of ISC, such as perceived interaction (Roth & Koenitz, 2019). However, considering that ISC is different from traditional content in that users actively interact with the content and complete the narrative, as well as its technological innovation in implementing such interactions, we believe it is necessary to examine the influence of overlooked factors in this context.

Given the limitations of existing studies, we take into account several distinctive features of ISC. First, users can perceive multidimensional interaction in ISC. Interaction is conceptualized as the dynamic information exchange between users and media (Bucy & Tao, 2007). However,

beyond objective interactivity, users' subjective experiences of these exchanges—what we term 'perceived interaction'—play a critical role in understanding engagement. Even if interactive elements are present, users may not always perceive them as highly interactive, making perceived interaction a crucial factor in explaining user engagement. In this study, we define perceived interaction as users' subjective evaluations of their engagement with interactive elements, irrespective of the actual interactivity embedded in the content. This distinction allows us to examine how users interpret and experience interactive storytelling content in a more nuanced way. Prior studies were applied by subdividing the perceived interaction according to the research questions and fields (Sun & Hsu, 2013). We explore perceived interaction that is highly related to ISC and put them into a research model. Second, we expect that users perceive ISC as an innovation, considering that it is a new technology or content. Therefore, we examine how users perceive the innovative attributes of ISC from the perspective of diffusion of innovations. Third, the characteristics of users' usage patterns are important. Several media studies have predicted user adoption by considering usage patterns of digital content. Although perceived interaction and innovation are related to user perception, the number of ISCs watched and the duration of Netflix subscriptions reflect the user's actual behavior. Through this, we consider not only user perception but also actual behavior as factors affecting the adoption of ISC from an integrated perspective. Fourth, users can use various devices to consume ISC. For example, Netflix can use ISCs through a variety of internet-connected display devices, including smart TVs, PCs, smartphones, tablets, and laptops (Netflix, 2020). In this study, we divide users into non-portable devices-centered user and portable devices-centered user groups and compare user perception and behavior between them. Finally, considering that the spread of ISC is at an early

stage, we apply various outcome variables such as flow experience and satisfaction as well as the intention to continue using ISC as adoption variables.

LITERATURE REVIEW

Interactive Storytelling Content

In general, the plot is completely controlled in linear storytelling content such as existing movies and TV series, and this is sometimes perceived as a limitation of traditional content (Coles, 2024). Conversely, ISC implements the choose-your-own-adventure format based on non-linear stories and a web of decisions (Elnahla, 2019). Its mechanism is particularly similar to the RPG (role-playing game), which is one of the game genres. RPG, unlike other game genres, considers narrative and player roles as important traits (Rolling & Adams, 2003). Like RPG players, ISC viewers can qualify the protagonist as their persona and interact with multiple story elements (Waskul & Lust, 2004). Another outstanding feature of ISC is that users can watch and play multiple stories in a single content. For example, in a movie, which is traditional video content, only one story exists in one content, but ISC users can compose several different narratives according to their own decisions and can experience various ways to develop the story even if they watch ISC multiple times (Netflix, 2020).

Although several global corporations, including Netflix, are focusing on launching ISC, there are not many ISC-related academic studies. Elnahla (2020) explained the characteristics of interactive genres such as ISC through a review of *Bandersnatch*, which was released on Netflix. He emphasized that interactive content gave passive viewers more control over the content, and ISC was a meaningful case of pioneering the path to integrated entertainment content. However, a limitation is that it did not conduct

empirical analysis to investigate users' perceptions. Unlike Elnahla (2020), Roth and Koenitz (2019) investigated various factors of perception (playtime, usability, enjoyment, etc.) of early users of ISC through an experimental study, one of the empirical methodologies. In addition, many previous studies have discussed ISC (bin Mohd Hanapiah, 2024; Fan, 2024), but rather than providing an empirical analysis to understand users, they tend to focus on understanding and reviewing ISC itself. Therefore, this study aims to address this limitation by exploring, at an exploratory level, how users are influenced by various factors of ISC and how they perceive it.

Previous studies agree that ISC is based on innovative factors such as interactive technology. Therefore, this study aims to examine the effects of ISC's perceived interaction and innovation as variables and examine their influences. This study set the dependent variables as flow experience, satisfaction, and intention to continue using ISC. In this study, flow, which is often used as a mediating variable to lead to affective and behavioral outcomes in research (Hoffman & Novak, 1996), was positioned as a dependent variable alongside satisfaction. The reason for this is that studies have verified not only the influence of flow on satisfaction but also the influence of satisfaction on flow (Chang, 2013; Wu et al., 2020). Therefore, in this study, the dependent variables will be broadly defined, and the study will exploratively examine the effects of the independent variables on flow experience, satisfaction, and intention to continue using ISC.

Perceived Interaction in Digital Content

The concept of interaction gained attention after the introduction of network-based media (Hoffman & Novak, 1996; Kioussis, 1999). As the domain of digital media is subdivided, the concept and types of interaction also differ somewhat by domain. Liu and Shrum (2002) defined interaction in a communication situation

as how they influence each other. From a broader perspective, interaction is defined as all actions a human does with an object within a particular environment (Lombard & Snyder-Duch, 2001). In this sense, users can perceive interactions while viewing, listening, and experiencing content (Hoffman & Novak, 1996). The comprehensive concept of interaction is proposed as a multidimensional concept according to the application field (Sun & Hsu, 2013). Previous studies argue that the multidimensional concept of interaction can be divided into three major dimensions, such as interactive actor, object, and environment.

McMillan (2002) subdivided interactions into user-to-user interaction, user-to-medium interaction, and user-to-content interaction from the perspective of computer-mediated communication. Cho and Leckenby (1999) also argued that users can perceive users-to-user, users-to-system, and users-to-content interaction with digital content. Johnson et al. (2006) also suggest that interaction should be divided into interpersonal, technical, and multiple perspectives. Similarly, previous studies have argued that interaction can be divided into functional and contextual aspects (Sundar et al., 2003). Um et al. (2005) modified the interaction of the three dimensions suggested by previous studies on digital content to fit digital online games area and suggested three dimensions: person-to-person (P2P), person-to-computer (P2C), and person-to-game (P2G) interaction. In summary, the detailed concept of interaction differs slightly depending on the detailed field of the study, but in general, users, content, and environmental interactions are considered important. This trend suggests that the interaction perceived by users within the digital content environment is expanding in various forms than in the traditional content environment. Therefore, it is a very meaningful approach to propose the dimension of interaction perceived by users appropriate to each application area.

Um et al. (2005) and other previous studies on the interaction of digital contents identified the dimensions of interaction related to ISC as person-to-person (P2P), person-to-computer (P2C), and person-to-storytelling (P2S) interaction. We propose the interaction dimensions for ISC as P2P, P2C, and P2S, based on previous studies dealing with the interaction of digital contents (Baron, 1999; Novak et al., 2000; Um et al., 2005). P2P refers to the level at which a user interacts with other users online or offline after watching ISC. P2C is the level of interaction that users experience from technical elements such as devices and networks between ISC use. Finally, P2S is the level of interaction users experience from ISC's storytelling elements. Given this, we explore how the three-dimensional interaction affects flow experience, satisfaction, and intention to continue using ISC, which are dependent variables frequently used in the digital content area of this study. This study aims to examine the influence of perceived interaction in the context of ISC. This focus is driven by the fact that content consumers actively engaging with and contributing to the creation of content through interaction is the most intuitive and distinctive feature that sets ISC apart from traditional content.

RQ1. What interaction dimensions (P2P, P2C, and P2S) of ISC significantly affect flow experience, satisfaction, and intention to continue using ISC?

Interactive Content as Innovation

The diffusion of innovation perspective has long been used to explain the adoption of digital technology by users. It is defined as “an innovation is an idea, practice, or object that is perceived as new” (Rogers, 2003, p. 12). In the current media environment, video, voice, and various types of platform elements are being integrated based on the advancement of digital technology (Atkin et al., 2015). The combination of existing content

and new technologies allows users to experience various levels of innovation that they have never encountered before. ISC is an innovative form of content that transitions from the passive consumption of traditional media to active engagement by content consumers, made possible through its integration with new technologies. In this regard, adopting the perspective of diffusion of innovation theory to examine user perceptions and adoption factors represents a meaningful approach to building the theoretical foundation in this field.

On the other hand, Rogers (2003) found that individuals consider the characteristics of innovation, such as relative advantage, compatibility, complexity, trialability, and observability, in adopting innovation. The diffusion of innovations assumes that relative advantage, compatibility, trialability, and observability positively (and complexity negatively) affect the rate of adoption of innovations (Rogers, 2003). Relative advantage is the perception that the user considers innovation to be better than what exists, and compatibility is the level at which innovation matches the user's perceived needs, values, and experiences. Complexity is the level at which the user perceives that it is difficult to use innovation, and trialability is the level of whether the user can experience the innovation around them. Finally, observability is the level at which others can see the function or form of innovation adopted by the user (Atkin et al., 2015; Hoffmann et al., 2007; Rogers, 2003).

Previous studies on video content (Cha, 2013; Ou & Cho, 2017; Sarrina Li, 2004) and online games (Chang et al., 2006) that reflect the characteristics of ISC also consistently argue that innovation factors influence user adoption. Although there are some differences depending on the research field, in general, previous studies constructed a research model using the five factors suggested by Rogers (2003). Regarding online gaming, Chang et al. (2006) applied all five innovation factors, confirming that only

relative advantage has a significant influence on determining whether users adopt online games. In the video content area, Cha (2013) found that relative advantage, complexity, and compatibility significantly affect the adoption of the online video platform. Kim et al. (2020) analyzed a research model composed of relative advantage, compatibility, and complexity, and confirmed that only compatibility affects the adoption of cord media. Ou and Cho (2017) confirmed that four innovations excluding complexity affect user satisfaction with Netflix and confirmed that relative advantage and compatibility have high explanatory power. Sarrina Li (2004) also examined how the five innovations affect the intention to adopt interactive cable television services and confirmed the influence of relative advantage.

By reviewing previous studies, we found that relative advantage is an important factor in explaining the adoption of digital content, and the influence of complexity and compatibility was also confirmed in several studies. On the other hand, some previous studies did not consider trialability and observability, perhaps because the two variables and the research topic are not appropriate, or because these factors have less explanatory power. In fact, a meta-analysis of the diffusion of innovations found that relative advantage, complexity, and compatibility factors more consistently influence adoption than do trialability and observability (Cha, 2013). In summary, previous studies have demonstrated the theoretical simplicity and robustness of the diffusion of innovations in the area of digital content and support that innovation factors can be applied as explanatory variables for the adoption of ISC.

In this study, we consider relative advantage, compatibility, complexity, and trialability as the innovation factors that influence ISC adoption. Considering that ISC is in the early stages of spreading through various platforms including Netflix, Stornaway.io, etc. we have supposed that

it would be difficult for ISC users to perceive observability.

RQ2. What innovation factors (relative advantage, compatibility, complexity, and trialability) of ISC significantly affect flow experience, satisfaction, and intention to continue using ISC?

Usage Patterns of ISC

The usage pattern is a determinant of digital content usage. Previous studies argue that active use of content can lead to a positive perception of the content (Kuem & Kim, 2018; Yoo & Park, 2018). Although usage patterns can be divided into various categories, we consider the amount and time spent on content as variables that explain the adoption of ISC.

Indicators of content-consumption time include the time spent (Kaczmarek & Drązkowski, 2014; Kuo et al., 2012) and the subscription period for the content (Yu et al., 2018). Yu et al. (2018) also considered subscription period and usage time together to measure user use of a live video-streaming platform. Loyal users are generally likely to use the content for a long time and reuse it (Parasuraman & Grewal, 2000). Considering the positive causal relationship between loyalty and adoption factors, the more time spent, the more likely users are to adopt the content. Supporting this, Yoo and Park (2018) argued that the subscription period of Netflix needs to be considered as a factor that determines the intention to continue using digital content.

Meanwhile, a digital content environment suitable for increasing the scale of content consumption has been established. In an environment in which a variety of content is supplied, users construct their program repertoire (Heeter, 1985) and consume a lot of content at once, such as binge-watching (Jenner, 2016). A subscription video on content platform demand (SVOD)-based like Netflix allows users to easily

increase their consumption scale because they can watch multiple contents at no cost.

In this study, we consider the duration of Netflix subscriptions and the number of ISCs watched as usage patterns of ISCs. We expected both to affect the adoption of ISC but considering that this is an early study, We propose the following research question.

RQ3. What usage patterns (the duration of Netflix subscription and number of ISCs watched) of ISC significantly affect flow experience, satisfaction, and intention to continue using ISC?

Differences in User Behavior by Device Type

Devices are hardware related to the interface of digital content. This is an important factor that determines content interface elements, such as viewer, color, text-sound, and graphics (Bahn & Kim, 2008). In digital content, especially online games, content with unique characteristics is being developed based on each device type (Nam & Kim, 2020). As can be inferred from this background, the type of device can cause a significant difference in the content consumption experience (Paik et al., 2017). Therefore, this study aimed to explore whether the device type influences the adoption of ISC.

Content devices can be divided into non-portable devices such as PCs and portable devices such as mobile devices. Non-portable devices have advantages in terms of display, such as screen size and definition, whereas portable devices are small and portable, so they are used anywhere at any time (Furió et al., 2013). Theoretically, non-portable and portable devices differ in terms of screen size, portability, and interactivity (Furió et al., 2013; Paik et al., 2017), it is important to analyze the moderating role of each device in how it changes user's content consumption experience.

Paik et al. (2017) categorized game users into

five types, based on online game devices (PC and smartphone): PC game-oriented users, PC and smartphone game-oriented users (three groups), and smartphone game-oriented users. The analysis confirmed that there were differences in the preferred game genre, motivations, demographic factors, use time, and level of mental health depending on the device type of the online game. Meanwhile, Furió et al. (2013) proposed iPhone and Tablet PC as educational game devices, and examined the influence of the characteristics of each device on the perception of content users. They generally reported that device type does not significantly affect user perception. However, the interaction perceived by users may depend on the device because of the device's screen size and weight.

Considering the results confirmed by previous studies, we expect that the types of devices that are mainly used will be related to adoption according to content use (Paik et al., 2017). In particular, ISC users are likely to experience different perceptions of ISC depending on the device type. However, prior studies mainly took an exploratory approach and did not present consistent results on which device determines the user's perception or behavior. Therefore, we want to prove whether the perception and behavior of ISC differ according to the device type.

RQ4. Does the device type (non-portable or portable device) determine the relationship between the explanatory variable and the dependent variable?

RESEARCH METHOD

Data Collection and Sample

We commissioned a survey through Macromill Embrain, a global online survey company, to confirm the number of South Korean users of Netflix's ISC. The first survey was conducted

from June 24 to 26, 2020, and only about 5.0% of respondents were identified as ISC users. We believe that the fact that the ISC is a just-released content influenced the low number of ISC users. The main survey was done from July 8 to 13, 2020. Only people who had experience with ISC as a Netflix subscriber participated in the survey; a total of 329 survey responses were collected and used for quantitative analysis (see Table 1).

MEASURES

The formulation of the questionnaire was informed by prior research, encompassing inquiries related to perceived interaction, innovation, usage pattern, intention to continuous use, satisfaction, flow, type of device for ISC, and demographic variables (see Table 2).

Except for demographic factors, usage patterns, and types of devices for ISC, all items were measured on a 5-point Likert scale (1, Strongly disagree, to 5, Strongly agree). First, 14 questions were applied based on previous studies that measured interaction (Baron, 1999; Friedl, 2002; Novak et al., 2000; Um et al., 2005) to understand the detailed dimensions of interaction. Um et al. (2005) proposed P2C, P2G, and P2P variables as the interaction of online games. Considering that ISC is similar in interactions to online games, Um et al. (2005) revised it to fit our study. P2G was renamed P2S (Play to Storytelling) because, unlike games, users interact with narrative elements in ISC. By conducting exploratory factor analysis for 14 items, which is a statistical technique used to identify relationships among variables without predefined factors, we excluded 2 items with a factor loading value of 0.60 or less and used 5 items for P2P, 4 items for P2C, and 3 items for P2S. Attributes of innovations are based on the concept of the Innovation Diffusion Theory (Rogers, 2003) and prior research on digital content (Chan-Olmsted & Chang, 2006). Compatibility, Observability, and Trialability

Table 1. Sample Profile Comparison

		Total		Non-portable devices-centered user		Portable devices-centered user	
		Frequency	%	Frequency	%	Frequency	%
Gender	Male	204	62.0	69	67.6	135	59.5
	Female	125	38.0	33	32.4	92	40.5
Age	15-19	28	8.5	3	2.9	25	11.0
	20-29	84	25.5	21	20.6	63	27.8
	30-39	89	27.1	35	34.3	54	23.8
	40-49	77	23.4	23	22.5	54	23.8
	50-59	51	15.5	20	19.6	31	13.7
Education	Less than High School	15	4.6	1	1.0	14	6.2
	High School	36	10.9	9	8.8	27	11.9
	College	40	12.2	6	5.9	34	15.0
	Bachelor's degrees or higher	238	72.3	86	84.3	152	66.9
Number of ISC's watched	1	164	49.9	52	51.0	112	49.3
	2	113	34.3	36	35.3	77	33.9
	3	29	8.9	8	7.8	21	9.3
	4	12	3.6	4	3.9	8	3.5
	5 or more	11	3.3	2	2.0	9	4.0
Total		329		102		227	

Table 2. Questionnaire Items

Variables	Items	References
Perceived Interaction	After watching ISC, you can check the opinions of other users.	Baron (1999), Novak et al., (2000), Um et al. (2005)
	After watching ISC, I can convey my opinion to other users.	
	P2P After watching ISC, I can confirm the recommendations and evaluation of other users.	
	After watching ISC, you can communicate with other users.	
	After watching ISC, I can provide my recommend and evaluation to other users.	
	During ISC viewing, I have experienced difficulties in video playing or interaction due to network problems.	
P2C	During ISC viewing, video or audio has disconnected regardless of my intention.	
	I have had difficulty watching ISC due to problems with devices.	
	I have had difficulty watching the ISC due to the delayed response time.	

Table 2. *Questionnaire Items (Continue)*

	Variables	Items	References
Perceived Interaction	P2S	ISC gives me plenty of time to interact.	Baron (1999), Novak et al., (2000), Um et al. (2005)
		ISC is provided with an appropriate story that I want according to my choice.	
Perceived Attributes of Innovations	Complexity	Using ISC affects the use of other interactive storytelling content.	Chan-Olmsted & Chang (2006), Flight et al. (2011), Rogers (2003)
		It is not easy to use and watch ISC online.	
		Using ISC is as difficult as regular storytelling content.	
	Compatibility	ISC fits my lifestyle.	
		ISC fits well with how I watch television.	
	Compatibility	ISC is compatible with most aspects of my video habit.	
		ISC is better than other general storytelling content.	
	Relative Advantage	Using ISC meets my needs more than general storytelling content.	
		Using ISC improves my lifestyle.	
	Trialability	ISC can be tested nearby.	
I can test the ISC on the video platform.			
ISC has environmental conditions to test.			
Usage Patterns	Number of ISC Watched	Select all content you have a viewing experience from among 9 ISCs.	Chan-Olmsted & Chang (2006)
	Duration of Netflix Subscription	How long have you been subscribing to the Netflix service? (month)	
Dependent Variables	Intention to continue using ISC	I will continue to use ISC in the future right along.	Bhattacharjee (2001), Cha (2013)
		I will use ISC in the future.	
		I will use ISC regularly in the future.	
	Satisfaction	I am very pleased with ISC.	Lee & Kwon (2013)
		I feel relieved that ISC meets my needs.	
		Overall, I am very satisfied with ISC.	
	Flow experience	When I was using ISC, I had a flow experience.	Chang & Zhu (2012), Novak et al. (2003)
		I was deeply engrossed in ISC.	
While using ISC, I was entirely absorbed.			
Groups	What devices do you mainly use to watch ISC?		-
	Non-portable devices-centered user	- Television - Computer (Desktop or laptop)	
	Portable devices-centered user	- Tablet - Smartphone	

were put into the model; each variable contains 3 items. The number of ISCs watched and the duration of a Netflix subscription were applied to the model as factors of usage patterns, and items were constructed based on research on digital television (Chan-Olmsted & Chang, 2006). For the number of ISCs watched, all 329 respondents were asked to choose what they watched from nine ISC services on Netflix as of July 2020. The duration of a Netflix subscription was measured in open-ended questions (months). The statements were: “How long have you been subscribing to the Netflix service?” (months). For ISC, to subdivide users into portable device-centered users and non-portable device-centered users, we investigated devices mainly used when using ISC. The statements were: “What devices do you mainly use to watch ISC?” Respondents selected only one of the four questions, and the group who selected Television and Computer (Desktop or laptop) was defined as non-portable device-centered users, and the group who selected Tablet and Smartphone as portable device-centered users.

The dependent variables are flow experience, satisfaction, and intention to continue using ISC; each variable contains three items. Items for flow experience were constructed based on prior research on flow experiences in online activities (Chang & Zhu, 2012; Novak et al., 2003; Um et al., 2005), and items for satisfaction were based on Um et al.’s (2005) research examining the relationship between the interaction of online game and satisfaction. Finally, the intention to continue using ISC was constructed based on previous studies related to media and content (Cha, 2013) (See Figure 1).

RESULTS

We examined how perceived interaction, innovation, and usage patterns of ISC affect the satisfaction, continuous use, and flow experience of ISC through multiple regression. We classified users into non-portable device-centered and portable device-centered groups and did exploratory factor analysis using 12

Figure 1. Research Question Modeling

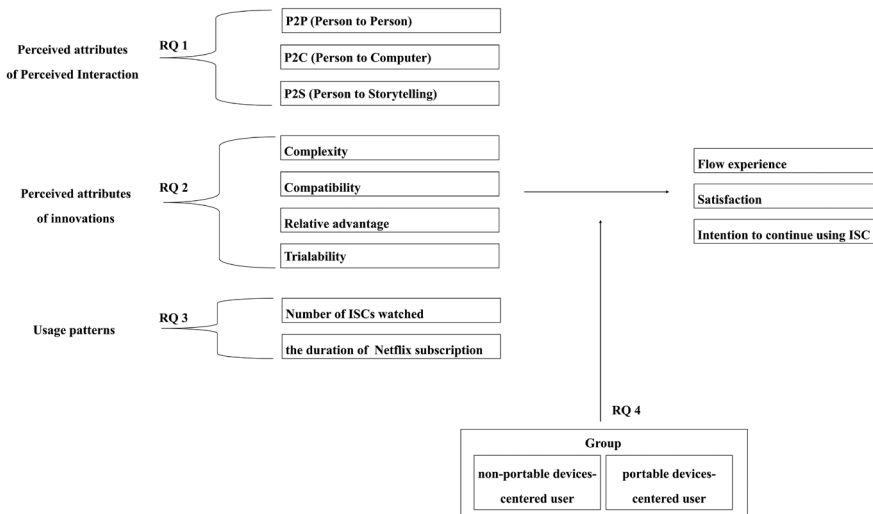


Table 3. Exploring Factor Analysis of Perceived Interaction on ISC

Perceived Interaction instrument	Non-portable devices-centered user				Portable devices-centered user			
	P2P	P2C	P2S	Cronbach alpha	P2P	P2C	P2S	Cronbach alpha
P2P 1	0.87	0.03	-0.01		0.84	0.09	0.13	
P2P 2	0.84	0.15	0.04		0.87	-0.04	0.04	
P2P 3	0.81	-0.01	0.11	0.84	0.77	-0.01	0.35	0.89
P2P 4	0.70	-0.10	0.15		0.78	0.06	0.18	
P2P 5	0.59	-0.01	0.43		0.79	-0.01	0.28	
P2C 1	-0.08	0.90	-0.02		0.01	0.87	0.07	
P2C 2	0.12	0.85	-0.01	0.86	0.05	0.82	0.01	0.59
P2C 3	0.16	0.82	-0.11		-0.01	0.85	0.03	
P2C 4	-0.12	0.76	0.07		-0.04	0.83	-0.03	
P2S 1	-0.04	-0.07	0.76		0.19	0.03	0.81	
P2S 2	0.29	-0.06	0.75	0.75	0.35	-0.17	0.66	0.85
P2S 3	0.09	0.07	0.67		0.19	0.41	0.58	
Eigenvalue	3.15	2.86	1.85		3.50	3.11	1.70	
% of variance explained	26.29	23.84	15.46		29.21	25.92	14.19	

perceived interaction items (see Table 3). We used varimax factor rotation, which is employed in factor analysis to enhance the interpretability by maximizing the variance of the squared loadings and promoting distinct factor structures, and applied an eigenvalue of 1.00 as a factor recognition criterion. We applied the factor-loading value of 0.60 or higher suggested by Hair et al. (2006) as a criterion to decide whether to include the factor. The exploratory factor analysis showed three factors in both groups, and these were similar to those of previous studies (Um et al., 2005). First, in the group of non-portable device-centered users, the factors had a total explanatory power of 65.5%. P2P showed 26.2% explanatory power of the total variance, followed by P2C 23.8% and P2S 15.4%. Similarly, the portable device-centered users group showed 69.3% of total explanatory power, P2P 29.2% of

the total variance, followed by P2C 25.9% and P2S 14.1%.

Cronbach's α for all items except the P2C items in the portable device-centered user group was above 0.70. Therefore, the reliability of most perceived interaction variables was verified (see Table 3). However, the P2C of the portable device-centered user group showed a Cronbach α of 0.59. Since this value is close to Cronbach's α minimum criterion of 0.60, we put the P2C of the portable device-centered user group into the study model.

Next, we did a correlation analysis to examine the association between independent variables (see Table 4). In each model, a correlation between independent variables was partially found, and all variables except the correlation coefficient between relative advantage and compatibility showed less than 0.60. After

Table 4. Correlation Matrix

	P2P	P2C	P2S	Complexity	Compatibility	Relative advantage	Triability	Number of ISCs watched	Duration of Netflix subscription
P2P	1	0.04	0.31 ^{***}	-0.01	0.35 ^{***}	0.31 ^{***}	0.32 ^{***}	0.07	0.12
P2C	0.04	1	-0.05	0.51 ^{***}	-0.11	-0.09	-0.02	0.16	0.03
P2S	0.31 ^{***}	-0.05	1	-0.06	0.45 ^{***}	0.44 ^{***}	0.29 ^{***}	0.05	0.10
Complexity	-0.01	0.51 ^{***}	-0.06	1	-0.29 ^{**}	-0.10	-0.09	0.12	0.10
Compatibility	0.35 ^{***}	-0.11	0.45 ^{***}	-0.29 ^{**}	1	0.63 ^{***}	0.41 ^{***}	0.25 ^{**}	0.15
Relative advantage	0.31 ^{***}	-0.09	0.44 ^{***}	-0.10	0.63 ^{***}	1	0.31 ^{***}	0.20 [*]	0.17
Triability	0.32 ^{***}	-0.02	0.29 ^{**}	-0.09	0.41 ^{***}	0.31 ^{***}	1	0.17	0.29 ^{**}
Number of ISCs watched	0.07	0.16	0.05	0.12	0.25 ^{**}	0.20 [*]	0.17	1	0.15
The duration of Netflix subscription	0.12	0.03	0.10	0.10	0.15	0.17	0.29 ^{**}	0.15	1
P2P	1	0.03	0.53 ^{***}	-0.06	0.55 ^{***}	0.57 ^{***}	0.47 ^{***}	0.17 ^{**}	0.03
P2C	0.03	1	0.15 [*]	0.46 ^{***}	0.00	0.12	0.05	0.10	0.01
P2S	0.53 ^{***}	0.15 ^{***}	1	0.08	0.49 ^{***}	0.46 ^{***}	0.48 ^{***}	0.10	-0.09
Complexity	-0.06	0.46 ^{***}	0.08	1	-0.02	0.03	-0.06	0.03	-0.10
Compatibility	0.55 ^{***}	0.00	0.49 ^{***}	-0.02	1	0.67 ^{***}	0.46 ^{***}	0.12	0.02
Relative advantage	0.57 ^{***}	0.12	0.46 ^{***}	0.03	0.67 ^{***}	1	0.41 ^{***}	0.21 ^{***}	0.04
Triability	0.47 ^{***}	0.05	0.48 ^{***}	-0.06	0.46 ^{***}	0.41 ^{***}	1	0.16 [*]	0.10
Number of ISCs watched	0.17 ^{**}	0.10	0.10	0.03	0.12	0.21 ^{***}	0.16 [*]	1	0.09
The duration of Netflix subscription	0.03	0.01	-0.09	-0.10	0.02	0.04	0.10	0.09	1

correlation analysis, we did a multicollinearity test, which assesses the degree of correlation among independent variables in a regression model, to grasp the correlation more clearly between independent variables. It showed all of them had more than 1 VIF (Variance Inflation Factor), so we decided that there was no problem with multicollinearity.

We did multiple regression analyses with the three dependent variables on the non-portable device-centered user group (see Table 5). In all, among the interactions, the influence of P2P and P2S interaction was confirmed. For the innovations, the influence of compatibility, relative advantage, and trialability was confirmed.

Usage pattern variables were not significant.

Specifically, they explained 52.7% of the total variance of the model for intention to continue using ISC ($R^2 = 0.52$). P2P ($\beta = 0.23, p < 0.01$), compatibility ($\beta = 0.31, p < 0.01$), and trialability ($\beta = 0.23, p < 0.10$) positively affected intention to continue using ISC. For the model in which Satisfaction was set as the dependent variable, the independent variables explained 50.0% of the total variable ($R^2 = 0.50$). Among the independent variables, P2P ($\beta = 0.16, p < 0.10$), P2S ($\beta = 0.18, p < 0.05$), relative advantage ($\beta = 0.24, p < 0.01$), and trialability ($\beta = 0.22, p < 0.01$) positively affected satisfaction. Finally, the explanatory power of the model applying flow experience

Table 5. Multiple Regression Analysis for the Non-portable Device-centered User Group

Independent Variables	Intention to continue using ISC		Satisfaction		Flow experience		VIF
	β	t	β	t	β	t	
Constant		0.17		.074		0.89	
Perceived Interaction							
P2P	0.23**	2.96	0.16 ⁺	1.95	0.13	1.48	1.25
P2C	-0.01	-0.12	-0.01	-0.06	-0.01	-0.18	1.40
P2S	0.09	1.12	0.18 ⁺	2.13	0.11	1.25	1.39
Perceived attributes of innovation							
Complexity	-0.02	-0.32	-0.06	-0.65	0.05	0.59	1.58
Compatibility	0.31**	2.87	0.16	1.44	0.38**	3.25	2.25
Relative advantage	0.19 ⁺	1.97	0.24**	2.42	0.20 ⁺	1.90	1.82
Trialability	0.11	1.38	0.22**	2.66	-0.10	-1.17	1.36
Usage pattern							
Number of ISCs watched	-0.03	-0.45	0.03	0.48	0.04	0.54	1.17
The duration of Netflix subscription	0.09	1.23	-0.06	-0.80	0.09	1.17	1.13
R ²		0.52		0.50		0.42	
Adjusted R ²		0.48		0.45		0.37	
Model Fit (F)		11.40**		10.22***		7.57***	

Non-portable devices-centered user group ($n = 102$)

⁺ $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$

as a dependent variable was 42.6% ($R^2 = 0.42$). For this model, the influence of interaction was not confirmed, and compatibility ($\beta = 0.38, p < 0.01$) and relative advantage ($\beta = 0.20, p < 0.10$) positively affected the flow experience.

Next, we analyzed the portable device-centered user group model for ISC in the three regressions and confirmed the influence of P2, P2S, complexity, compatibility, relative advantage, and trialability. In addition, unlike the non-portable device-centered user group, the usage patterns, such as the number of ISC and Length of Watching ISC, influenced the dependent variable.

Specifically, In the model for intention to continue using ISC, the independent variables

explained 51.2% of the total variance ($R^2 = 0.51$). In innovations, we confirmed that complexity ($\beta = -0.10, p < 0.05$) negatively affects, and compatibility ($\beta = 0.31, p < 0.01$) and relative advantage ($\beta = 0.28, p < 0.001$) positively affect intention to continue using ISC. In the usage patterns, only the number of ISCs ($\beta = 0.08, p < 0.10$) has a positive influence on the intention to continue using ISC. For the satisfaction model, the independent variables explained 57.8% of the total variance ($R^2 = 0.57$). Among the interactions, we confirmed that only P2S ($\beta = 0.12, p < 0.01$) positively affects satisfaction, whereas the influence of all innovations was confirmed. Specifically, complexity ($\beta = -0.13,$

Table 6. Multiple Regression Analysis for the Portable Device-centered User Group

Independent Variables	Intention to continue using ISC		Satisfaction		Flow experience		VIF
	β	t	β	t	β	t	
Constant		2.13		3.60		2.12	
Perceived Interaction							
P2P	0.08	1.33	0.09	1.61	0.17**	2.70	1.87
P2C	-0.00	-0.01	-0.01	-0.07	0.08	1.49	1.33
P2S	0.06	1.03	0.12**	2.21	0.06	1.01	1.73
Perceived attributes of innovation							
Complexity	-0.10*	-2.00	-0.13**	-2.56	-0.10*	-1.97	1.31
Compatibility	0.31***	4.53	0.25***	3.90	0.21**	3.12	2.15
Relative advantage	0.28***	4.02	0.28***	4.43	0.33***	4.77	2.15
Trialability	0.07	1.32	0.18**	3.37	0.04	0.71	1.53
Usage pattern							
Number of ISCs watched	0.08*	1.69	-0.03	-0.74	0.05	1.02	1.07
The duration of Netflix subscription	0.01	0.32	-0.03	-0.81	-0.11*	-2.28	1.05
R ²		0.51		0.57		0.51	
Adjusted R ²		0.49		0.56		0.49	
Model Fit (F)		25.25***		32.99***		25.52***	

Non-portable devices-centered user group (n = 227)

*p < 0.10, *p < 0.05, ** p < 0.01, ***p < 0.001

$p < 0.01$) negatively affects, and compatibility ($\beta = 0.25, p < 0.01$), relative advantage ($\beta = 0.28, p < 0.001$), and trialability ($\beta = 0.18, p < 0.001$) positively affect satisfaction. Finally, the explanatory power of the flow experience model was 51.4% ($R^2 = 0.51$). Among the interactions, only P2P ($\beta = 0.17, p < 0.01$) had a positive effect on flow experience. In innovations, complexity ($\beta = -0.10, p < 0.05$) negatively, compatibility ($\beta = 0.21, p < 0.01$), and relative advantage ($\beta = 0.33, p < 0.001$) positively affect flow experience. For usage patterns, only the length of watching ISC ($\beta = -0.11, p < 0.05$) negatively affects the flow

experience (see Table 6).

Next, we confirmed that the influence of independent variables between non-portable device-centered users and portable device-centered users was somewhat different (see Table 6). In the model of Intention to continue using ISC, the model explanatory power was somewhat higher for non-portable device-centered users. In addition, the influence of P2P, compatibility, and relative advantage of non-portable device-centered users was confirmed, whereas, in the portable device-centered user group, the influence of complexity, compatibility, relative advantage,

Table 7. Multiple Regression Analysis Comparison

Independent Variables	Intention to continue using ISC		Satisfaction		Flow experience	
	NP group	P group	NP group	P group	NP group	P group
	β	t	β	t	β	t
Perceived Interaction						
P2P	0.23**	0.08	0.16+	0.09	0.13	0.17**
P2C	-0.01	-0.01	-0.01	-0.01	-0.01	0.08
P2S	0.09	0.06	0.18*	0.12**	0.11	0.06
Perceived attributes of innovation						
Complexity	-0.02	-0.10*	-0.06	-0.13**	0.05	-0.10*
Compatibility	0.31**	0.31***	0.16	0.25***	0.38**	0.21**
Relative advantage	0.19*	0.28***	0.24**	0.28***	0.20*	0.33***
Trialability	0.11	0.07	0.22**	0.18***	-0.10	0.04
Usage pattern						
Number of ISCs watched	-0.03	0.08*	0.03	-0.03	0.04	0.05
The duration of Netflix subscription	0.09	0.01	-0.06	-0.03	0.09	-0.11*
R ²	0.52	0.51	0.50	0.57	0.42	0.51
Adjusted R ²	0.48	0.49	0.45	0.56	0.37	0.49
Model Fit (F)	11.40***	25.25***	10.22***	32.99***	7.57***	25.52***

NP group: Non-portable devices-centered user group ($n = 227$)

P group: Portable devices-centered user group ($n = 102$)

* $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

and number of ISCs watched was confirmed.

For the model of satisfaction, P2P, P2S, relative advantage, and trialability affected the satisfaction of non-portable device-centered users. On the other hand, among perceived interaction, only P2S and all attributes of innovations showed a significant influence on the satisfaction of portable device-centered users. The explanatory power of the model was higher for portable device-centered users than for non-portable device-centered users, which is different from the model of Intention to continue using.

As in the model of flow experience and perceived attributes of innovations, compatibility, and relative advantage influenced the flow experience of non-portable device-centered users, the influence of perceived interaction was not confirmed. On the other hand, in the portable device-centered user group, we confirmed the influence of P2P and that complexity, compatibility, and relative advantage influenced flow experience. The explanatory power was somewhat higher for portable device-centered users than for non-portable device-centered users (see Table 7).

CONCLUSION AND DISCUSSION

In this study, we examined the factors that influence the flow, satisfaction, and continuation intention of ISC by surveying ISC users in South Korea, one of the countries with high digital content consumption. Considering that this is an early empirical study on ISC, we investigated the various nine independent variables included in the categories of perceived interaction, innovation, and usage pattern. In addition, we refined the research design by analyzing the differences between portable device-centered users and non-portable device-centered users.

RQ1 asked whether interaction dimensions including P2P, P2C, and P2C of ISC would affect the three dependent variables. Exploratory factor

analysis largely identified interaction as P2P, P2C, and P2, which reflects the perspective of previous studies on interaction (McMillan, 2002; Um et al., 2005). Our results support the fact that interaction can be distinguished in terms of individuals, subjects, and environments depending on each field. In both device-based user groups, the effects of P2P and P2S were confirmed. The effects of P2P can be interpreted in two ways. First, users are more likely to use ISC as a topic source to communicate with others. Previous studies on content have consistently found the influence of social motivation (Borbora & Srivastava, 2012). The effects of P2P are likely due to users' social motives. Second, we believe that the influence of P2P stems from the desire to encounter new narratives that users have not experienced. A feature of ISC is that users can experience new narratives each time they watch ISC. Users are likely to actively participate in interactions with others to learn about new narratives that user themselves have not discovered. That is, social motivation and interest in new narratives drive P2P, which leads to adoption. In addition, the effects of P2S were found to have a positive effect on satisfaction in both models. ISC contains a large number of plots, and users can choose from a variety of alternative stories (Stern, 2008). Users are also given the impression that they can influence the outcome of the story through interactions by using controllers or touch (Vosmeer & Schouten, 2014). These attributes of ISC consistently allow users to interact with the story, and as a result, positive attitudes toward ISC may be formed. Interestingly, the effect of P2C was not found in the analyses. This indicates that the interaction with the Netflix system is not a burden or an important factor in the use of ISC.

RQ2 examined the effects of perceived innovation attributes of the ISC on flow, satisfaction, and continuous use of ISC. The effects of innovation factors were generally confirmed in the analyses. In the non-portable device-centered user group, compatibility, relative

advantage, and trialability, excluding complexity, were significant. Compatibility showed more explanatory power than other innovations. Users have experience with OTT platforms and RPG games, which take formats similar to ISC. Therefore, users may experience high suitability for ISC based on their experience with existing technologies and how they are used, which may lead to innovation adoption (Rogers, 2003). On the other hand, the insignificant effect of relative advantage may result from differences in properties between ISC and existing storytelling content. If the two types of content have similar properties, users are likely to perceive the relative advantage of an innovation such as ISC as high, but if the opposite is true, it is difficult for users to compare their advantages. This result probably means that the two types of media are substitutes, rather than complements. Relative advantage had significant effects on all outcome variables. These results are consistent with most of the previous studies of the diffusion of innovations that proposed relative advantage as an important predictor (Cha, 2013; Chang et al., 2006). We found that relative advantage is an important variable in explaining the adoption of innovation regardless of the nature of each research field.

In the model of the portable device-centered user group, all innovations were identified as significant variables. Note that, unlike the model of non-portable devices, complexity negatively affects all outcome variables, as is consistent with Rogers' (2003) assertion that the level of adoption decreases when users find innovations to be difficult to understand or use. This result shows that the user interface of portable devices is still difficult to use from the perspective of general users. Although it has become easy to use portable devices such as smartphones, people who are familiar with traditional media, such as TV and PC, find it inconvenient to operate portable devices to use ISC.

In RQ3, the effects of usage patterns were only confirmed in the model of the portable device-

centered user group. Similar to Yu et al. (2018), our study also proved that the two variables need to be considered together in the category of usage patterns. Specifically, users who have viewed multiple ISCs are more likely to continue to use ISCs. Thus, as users increase the number of uses, they have an attachment or loyalty to the ISC, and continuation occurs based on this. ISCs offered by Netflix have different genres. For example, *Black Mirror: Bandersnatch* is a TV series, and *You Vs. Wild* is reality. *Puss in Book: Trapped in an Epic Tale* is based on a fairy tale, *Minecraft: Story Mode* is a game, and *Buddy Thunderstruck: The Maybe Pile* is a stop-motion series. In an environment with such a variety of genres, users can easily increase the amount of ISC usage, which leads to continuation by mediating perceived interest. Future research needs to explore the mediating variables between the number of ISCs viewed and continuation. In the meantime, our study showed that the shorter a user's Netflix subscription period is, the more likely the user is to continue ISC. This finding reflects the characteristics of the initial users. Users who have been using the OTT service for a long time are likely to have their own content repertoire. Users form a consistent usage pattern (repertoire) by considering their tastes and convenience in various content environments (Heeter, 1985). Initial users of the service have not clearly formed their usage patterns, so they are likely to actively explore innovative content, including ISC.

This study identified differences in the effects of perception and usage of ISC on continuation intentions and experiences depending on the type of device. Specifically, complexity and usage patterns were confirmed only in the model of the portable device-centered user group. In addition, the adjusted R^2 s of the portable device-centered user group were relatively high compared to those of the non-portable device-centered user group. These results differ from the previous study by Furió et al. (2013) which claimed that there were no significant differences in user perceptions

across devices, indicating that the functional and user interface differences between non-portable and portable devices need to be considered in content usage studies. Users seem to be more likely to have a more consistent experience and perception when using portable devices, which are mainly a smartphone and a tablet, and the UI for interaction is screen touch, which is the same for almost all devices. In contrast, we counted smart TVs and personal computers as non-portable devices. These devices interact through a variety of controllers, such as remote control, keyboard, and mouse. Unlike portable devices with the same UI, non-portable devices have different UIs. Netflix has a cross-platform strategy that allows different devices to use ISCs with the same properties. This makes it clearer that the difference in impact across devices is due to the UI, not the content properties.

In this study, we have integrated the perspectives of three sub-interaction, innovations, and usage patterns. In this new media environment, the integrated model we propose is expected to adequately explain the adoption of innovative content. This study was also an initial study of ISC that expanded the scope of dependent variables by including intention to continue use, satisfaction, and flow experience. In future research, a detailed model can be developed through theoretical elaboration based on the relationship presented in this study.

Our findings have academic implications. First, this study makes a significant contribution to the understanding of ISC adoption by uniquely integrating perceived attributes of interaction, innovation, and usage patterns into a comprehensive framework. This integration is noteworthy as it brings together the subjective perceptions of users—capturing the complexities of interaction and innovation—and usage behaviors, which were often considered separately in previous research. Furthermore, by conceptualizing interaction as a multidimensional construct, this study enhances explanatory power,

offering a deeper understanding of how different forms of interaction, such as Person to Person (P2P), Person to Computer (P2C), and Person to Storytelling (P2S), impact user engagement. This multidimensional approach helps to shed light on the nuanced factors influencing the adoption and engagement with ISC. Additionally, by identifying device-specific differences in user experience and perception, this study underscores the critical role of user interface design in adopting digital content. For example, we found that users who primarily consume ISC on portable devices may exhibit different engagement patterns compared to those using non-portable devices, highlighting the need for tailored design strategies. Future research could build on these contributions by exploring the relationships identified in this study with greater theoretical precision.

Our findings have practical implications for the digital content industry. First of all, to drive the adoption and continuation of ISC, users need to be fully aware of the interaction. If providers offer a community where users can share their experiences and explore the opinions of others after viewing ISC, they will perceive a high level of P2P, which will drive adoption. Similarly, there should be a variety of ways to interact within the story. To provide a rich story through interaction, providers need to build complex story flows, which takes a lot of time and money. Therefore, providers need to realize cost savings by considering the actual interactions that change the composition of the story and the 'fake' interactions, which give only interaction opportunities and do not affect the story structure. For example, 'choose what cereal to have for breakfast,' or 'choose what music the main character is currently listening to.' A study by Vosmeer and Schouten (2014) confirmed that the fake interaction did not differ significantly from the experience gained from the actual interaction. Therefore, it is necessary to form an efficient ISC so that users can access many opportunities for interaction by appropriately

applying all dimensions of interaction. One thing we should keep in mind is that the complexity of interaction affects users differently depending on the device they use. According to our findings, increased complexity can negatively impact portable device users. This can be understood by considering the smaller screen size of portable devices compared to non-portable devices. Given the nature of ISC, where additional interaction buttons must be inserted into the content, this suggests that content providers should focus on keeping interactions intuitive and simple when designing the content. Providing simpler and more intuitive interactions can ensure a smoother and more enjoyable user experience. One possible suggestion is to minimize complexity and avoid obstructing the screen with too many buttons by not displaying the options right away. Instead, inform the user that they are in a section where choices are available, and allow them to view the options only when they want to reflect their choice. This approach gives users the option to engage with the complexity selectively, providing them with the flexibility to navigate without being overwhelmed. We also found that users with shorter Netflix subscription periods are more likely to adopt ISC. This can also be interpreted as suggesting that long-term subscribers, who already have loyalty to the platform, show less influence regardless of the new content type, since their loyalty is already established. However, we cannot overlook the fact that, based on these findings, consistently exposing new platform users to ISC content can be an effective promotional strategy that leads further to platform loyalty.

However, this study has the following limitations. First, this study has limitations in that data were collected exclusively from South Koreans, focusing solely on ISC content on Netflix. While Netflix, as the first OTT platform to introduce ISC and one that has garnered significant attention, was chosen as the research subject, the findings may be influenced by the unique context of South Korean users.

Second, the data used in this research are not up to date. Given the rapid advancements in interactive technologies, significant shifts in user perceptions and behaviors, particularly due to the COVID-19 pandemic, and the rapid development of generative AI, the findings may require additional variables to account for the temporal gap and changes in behavioral and technological factors. Further examination is needed to better understand the current dynamics and user engagement with interactive content. Finally, this study has a limitation in that it divided users' device usage types into two categories (non-portable devices centered user & portable devices centered user). While the focus was on examining the differing relationships based on different user interfaces, an explanation for users who use a combination of devices in a hybrid manner may be lacking.

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