Unique Attributes of Internet TV in Enhancing Students' Learning Experience

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Abstract

Internet TV as a mobile entertainment has become an interesting medium in creating awareness on news and current issues to the public. Nowadays the traditional television which only allows audiences to be at one specific place has contributed to Internet TV use. Besides, the expensive cost of technology such as money value may contribute to barriers to integrate with higher learning obligations. Currently, Internet TV in Malaysia is focused mostly on business and technology impact. Few studies have been conducted on specific attributes of Internet TV as the factors that influence students to adopt. The unique characteristics (content, cost, monetary and technology) of Internet TV may play a vital task in formulating the user's expectation of Internet TV. Thus, this paper studies specific attributes of Internet TV in enhancing students' learning experience. A modified framework of previous research on new technology adoption such as the internet, smartphones, and IPTV was used to explore the exogenous variables that influenced students to adopt. A total of 518 respondents were selected among the undergraduate students via online survey which were analyzed through covariance-based structural equation modeling. The findings supported the idea that specific attributes of Internet TV, give impact to students' intention to use as part of the medium in learning. Results of the hypotheses showed a positive and

significant effect towards the Internet TV adoption on TV news. The results also improved our knowledge and understanding in a mission to inform that Internet TV can be part of the educational approach in teaching and learning. In conclusion, the innovation technology framework is a good theoretical medium to understand factors that influence students to adopt Internet TV on news and current issues. This study is both beneficial and significant for the researchers, educators, media practitioners, and public in order to keep modern technology and education in line.

Keywords: *Specific Attributes, Internet TV, Learning Experience Students*

Dampak Ciri-Ciri Khusus Televisyen Internet terhadap Pengalaman Pembelajaran Mahasiswa

Abstrak

TV Internet dengan ciri hiburan mudah alih telah menjadi satu medium yang menarik dalam mewujudkan kesedaran mengenai berita dan isu semasa kepada orang ramai. Televisyen tradisional yang terhad kerana hanya membolehkan khalayak berada pada satu tempat tertentu telah menyumbang kepada penggunaan TV Internet yang lebih meluas kini. Selain itu, kos teknologi yang mahal seperti nilai wang boleh menyumbang kepada halangan untuk mengintegrasikan dengan pembelajaran yang berimpak tinggi. Pada masa ini, TV Internet di Malaysia lebih memberi tumpuan kepada impak perniagaan dan teknologi. Kurangnya kajian terhadap ciri-ciri khusus TV Internet sebagai faktor yang mempengaruhi pengguna untuk menerima pakai. Ciri-ciri unik (kandungan, kos, kewangan dan teknologi) TV Internet mungkin memainkan tugas penting dalam merumuskan jangkaan pengguna terhadap TV Internet. Oleh itu, kertas kerja ini mengkaji sifat-sifat tertentu TV Internet dalam meningkatkan pengalaman pembelajaran pelajar. Rangka kerja penyelidikan terdahulu mengenai penggunaan penerimaan teknologi baru seperti internet, telefon pintar, dan IPTV digunakan untuk meneroka pembolehubah eksogen yang mempengaruhi pelajar untuk menerima pakai. 518 responden telah dipilih dalam kalangan pelajar Diploma dan Ijazah menerusi soal selidik dalam talian yang dianalisis melalui Pemodelan Persamaan Struktur (SEM) berasaskan kovarian. Penemuan ini menyokong idea bahawa ciri-ciri unik TV Internet mendorong pelajar untuk menggunapakainya sebagai salah satu daripada pelbagai medium dalam pembelajaran. Hasil dapatan juga mampu meningkatkan

pengetahuan dan pemahaman yang bertujuan untuk menjadikan TV Internet sebagai sebahagian daripada pendekatan pendidikan dalam pengajaran dan pembelajaran. Kesimpulannya, rangka kerja teknologi inovasi merupakan medium teoretikal yang baik bagi memahami faktor-faktor yang mempengaruhi pelajar dalam mengadaptasi TV Internet untuk program berita dan isu semasa. Kajian ini bermanfaat dan penting bagi penyelidik, pendidik, pengamal media dan orang ramai dalam memastikan teknologi dan pendidikan berjalan sejajar

Kata Kunci: *Ciri-Ciri Khusus, TV Internet, Pengalaman Pembelajaran, Pelajar, Pemodelan Persamaan Struktur (SEM)*

Introduction

Internet TV is a convergent technology that delivers TV shows through the internet, which is more customized and interactive to users. Currently, the Internet TV has become famous and has been acknowledged by the public and private sectors. Moreover, Internet TV is known as a worthwhile technology that affects the communications and broadcasting industry which is capable of contributing a new business model to the world. Meanwhile, there is no common agreement on a definition for this new kind of broadcasting. Ferguson (2012, p.143) claimed that Internet TV is "online programming that makes media content available through a computer screen, tablet or speaker. It can displace or substantially supplement the use of non-computer media content". Schechner and Stewart (2012) explained that Internet TV is an online video service that uses website streaming to offer TV programmes or videos. Thus, Internet TV is well-known for its entertainment medium that can be assessed anytime and anywhere. The traditional media offered the latest news and current issues to audiences. However, due to some obstacles, audiences especially the students may not have the opportunity to watch. Thus, Internet TV offers a more interactive platform for students to stream the latest news especially in completing their assignments. For example, smartphones are the best medium to discuss a specific topic with classmates, friends or followers on social media. Their positive arguments might contribute to the impact on certain issues. Moreover, media technologies such as online medium may help the student to upgrade themselves to be more creative and being updated 24/7 on

issues that happened in our surroundings. We identified that the unique characteristics of Internet TV may play a vital task in formulating the user's expectation. As Internet TV is categorized as a broad range of innovative technology, users would be attracted to the implicit or explicit attributes of Internet TV such as content-related attributes, cost efficiency, monetary benefits, and technology attributes. Therefore, these attributes can be identified as the deciding factors of Internet TV adoption.

In many higher educational institutions, Internet has been used in the classroom as part of the learning platform. Dzaa Imma et al., (2017) found that Internet access on educational channel become a positive impact and has been confirmed and accepted. The Internet allows for more flexible and wider availability and enhanced students' education performance. Thus, Iskrenovic (2015) said that the Internet has the possibility of enabling student-centered learning. Students would stream online news Bernama TV, Astro Awani, Bulletin Utama (TV3), Berita RTM (MyKlik) and Al-Hijrah either live or archive. Therefore, it is important to conduct a study that focuses on students' cognitive assessment through innovative technology for better learning environment.

Objective and Hypotheses

The objective of this study is to identify the relationship between unique attributes of Internet TV and students' intention to adopt and stream Internet TV news. The framework that has been used in this study was adopted and modified by Lin (2001) and Lee, Son, Yoo and Lee (2011) which study the Internet and IPTV adoption respectively. Television news and newspaper are still important and widely used by many people. However, the decreased numbers of traditional media use such as TV viewing in general and TV news specifically, among younger people (Dzaa Imma et. al. 2017) have raised these concerns among researchers especially the educators.

The high responses or statistics of online video streaming among younger users should be utilized by digital TV providers or broadcasters in order to produce more quality programmes such as news and current issues. Moreover, studies have shown that young adults usually have significant

experiences with mobile internet access (Wong, Tan, Ooi & Lin, 2014). Such scenarios to access Internet TV influences users' perception of whether the online medium gives impact to the systemic enhancement of students' learning experience. Therefore, we advance our hypotheses as follows:

H1: Content attributes have a positive and significant effect on intention to adopt Internet TV.

H2: Cost attributes have a positive and significant effect on intention to adopt Internet TV.

H3: Monetary attributes have a positive and significant effect on intention to adopt Internet TV.

H4: Technology attributes have a positive and significant effect on intention to adopt Internet TV.

Literature Review

As innovation diffusion perspective has been widely studied on various type of technologies, Internet TV specific attributes have been related to the exclusive features of television and its unique usage contexts. There are many studies on Internet technology adoption and usage patterns but Internet TV has specific characteristics which are unique from other media especially the traditional media. In adopting new technology, there are three aspects that have always been discussed in research such as the content, technological benefits, and cost-efficiency. Lee et al., (2011) in their study about IPTV adoption emphasized on three attributes such as content diversity, interactivity, and monetary benefits. In this study, the researchers have combined a few attributes from both studies which are relevant to Internet TV attributes. The researchers recognized that the unique characteristics of Internet TV play an important role in formulating the consumer's expectation of Internet TV. Therefore, four attributes that influence users' intention to adopt have been identified which are content, cost, monetary benefits, and technological benefits.
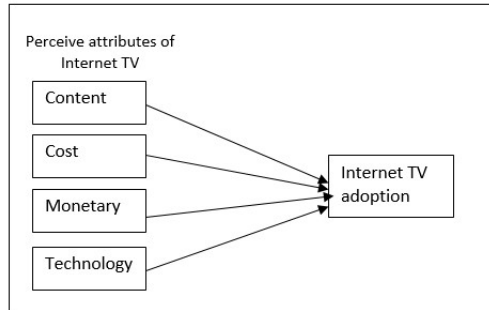
Figure 1: Research framework based on new media technology adoption.

Content

Many studies have proved that the content or TV shows played an important role in influencing people to watch. Content related attributes in this study are discussed to the extent to which Internet TV is perceived as offering various types of content with quality videos and current (latest) TV shows to Internet users. For instance, Internet TV is one of the innovative content services empowered by technology convergence which offers a diversity of digital media contents using technologies and communication in order to fulfill users' needs. Among the most popular are the video on demand, multi-channel broadcasting, online games, and other interactive services. Internet TV allows users to stream a variety of TV shows anytime and anywhere via an open internet access with high speed internet connection. Therefore, Internet TV has potential for thousands of videos. Digital system allows Internet TV providers to transmit high quality content through new digital transmission devices. A study conducted by Cha (2012) discovered that the selectivity of movies is one of the prominent factors that give impact to college students' decisions to choose DVD rentals over other movie distribution channels such as movie theaters, the Internet, and video on demand. Thus, better content variety and quality will contribute to competitive advantage of new media.

Cost

The cost has almost always been a driving force behind the adoption of an innovation. This study concentrated on effort and time efficiency

in searching Internet TV shows or news that links to users' intention to use. The online video platform reduced the search costs by permitting users to access Internet TV structures easily either on apps or websites. It is comparatively understood that online platforms decreased the time and effort used as compared to traditional platforms. A new medium will have a potential opportunity to replace an older medium when it provides a cost-benefit to the customers. Many studies also found that the importance of cost of a medium or system influenced users to adopt the medium. Wong et al., (2014) found that mobile shopping offers lower costs over conventional shopping. They claimed that the unique attributes of mobile shopping have changed the conventional shopping experiences which is more convenient and can be accessed at any time. Thus, this study investigates how time and effort efficiency in using Internet TV may encourage users to adopt.

Monetary

The economic advantages of the Internet and video on demand as movie platforms increased the probability of using online video. The small variation in pricing may contribute to the amount of use and intention to adopt. Some of the internet users may think that it is cheaper to pay for what you have watched instead of paying for a bundle of video content which is applied by the satellite television services or Internet TV providers, since users never watch some of the content in the bundle. The pricing plan which offers more saving value may support the specific attributes of Internet TV compared to traditional broadcasting TV. There are many pay Internet TV providers with packages or plans that have been offered by telecommunications companies and Internet Service Providers. These companies provide a better plan or better price for users to compete effectively with other competitors. Meanwhile, Hong and Jamed (2016) mentioned that when more users perceived low price, the more they adopt to mobile banking. The price which offers the best monetary benefits encouraged users to adopt. Thus, monetary values become an important variable in this study.

Technology

Internet TV also has vital features such as interactivity, personalization, time-shifting, information related media and reliability. The advantages

of technological growth are a major factor that contributes users to adopt to a new system. As compared to traditional media, the internet has many special benefits. Users can update content continuously, effective searching and allows interaction as well. Internet features or structures make users' experiences more comfortable and easier to stream. The Internet TV news is able to produce interactivity, multimedia content, for example, online forums, searching news archives, link to related news and frequently updated. Internet TV exploits a more interactive multimedia system using streaming technologies via the network. The transmission speed, storage capacity, audiovisual quality, transferability, interactivity, transmission quality and speed may influence users to adopt Internet TV. As mentioned by Ratten (2014), technology services are among the factors that influence consumer to adopt innovation. Meawhile, Sang-ug Kang, Seungbum Park and Sangwon Lee (2014) claimed that interactivity is positively related to IPTV and DCTV (Digital Cable TV) of new service environment.

Methodology and Data Analysis

The population of this research consists of undergraduate students at the Faculty of Communication and Media Studies from Universiti Technologi MARA, Melaka campus. There are 1,250 full-time students. A size of 384 respondents as a sample should be an appropriate minimum of this population (Krejcie and Morgan, 1970). Meanwhile, Hair, Black, Babin, Anderson, and Tatham (2006) suggested that sample in a range of 150-400 is stable when using the Structural Equation Model (SEM). In total, 550 questionnaires were distributed, and 518 representing were returned. The survey used a purposive sampling technique.

The analysis was conducted using SPSS and Amos version 23. In an effort to establish an initial instrument's reliability, a pilot study, comprising of 30 respondents, was carried out. The descriptive statistics is shown in Table 1. Overall, total number of male students were 220 and female 298. Most of the age range was 18 to 19 (52.6%), followed by age from 20 to 21 (30.6%). Most of the students used Internet TV for one to two days (49.7%) and a majority spent less than one hour (93.5%). Most students used the smartphone to access Internet TV (60.8%) and mobile data (59.1%) for news streaming.

Instruments

The instruments used were adapted from innovation technology adoption and past literature review. The questions also included demography items. Respondents were asked about a) content-related attributes such as content variety, quality, and latest programme; b) cost efficiency such as time and effort; c) monetary benefits such as superior plan, value for money and d) technology attributes such as interactivity, personalization, time-shifting, information related media and reliability. Content and technology attributes were adapted from the previous researchers such as Chyi and Sylvie (2001), Smith (2001), Viswanathan (2005), Simon & Kadiyali, (2007). Meanwhile, the cost was adapted from Teo &Yu (2005), Srinivasan & Ratchford (1991) and Liang & Huang (1998) and monetary benefits from Sweeney and Soutar (2001). And lastly, intention to adopt was adapted by Venkatesh, Morris, Davis, & Davis (2003). The constructs used four-point Likert scales, from 1 (strongly disagree) to 4 (strongly agree).

Table 1: Descriptive statistics (n=518)

Item		Frequency (%)
Gender	Male	220 (42.5)
	Female	298 (57.5)
Age	<18	62 (12)
	18-19	272 (52.6)
	20-21	159 (30.6)
	>22	25 (4.8)
Usage Frequency (Days in a week)	1 to 2 days	175 (49.7)
	3 to 4 days	120 (34.1)
	5 to 6 days	34 (9.7)
	7 days	23 (6.5)
Time (mins)	less than 1 hour	329 (93.5)
	1 hour to 2 hour	13 (3.7)
	more than 2 hour	10 (2.8)

Device Use	Smartphone	214 (60.8)
	Ipad/tablet	57 (16.2)
	Laptop/notebook	70 (19.9)
	Computer	11 (3.1)
Internet Access	Own Broadband	98 (27.8)
	Mobile Data	208 (59.1)
	Wifi accessed from the university	46 (13.1)

Analysis of Measurement Model

First of all, measurement model has been analyzed in order to measure the validity procedure which is called confirmatory factor analysis (CFA). The CFA method has the ability to access the unidimensionality, validity and reliability of a latent construct. The structural model was later examined for its fit and strengths of the structural paths hence support for the hypotheses (refer Table 2).

The unidimensionality must be conducted earlier before assessing validity and reliability. The factor loading items should be 0.6 or higher and must be positive. The validity includes convergent validity, construct validity and discriminant validity. It is essential to conduct Average Variance Extracted (AVE) for each construct to measure the validity. Mat Roni, Djajadikerta and Ahmad (2015) mentioned that to have a good discriminant validity, the square root of AVE for each construct must be higher than the construct's correlations with other constructs (refer Table 3). If the correlation between the constructs exceeds 0.85, it indicates redundant exogenous constructs. Zainuddin Awang (2015) mentioned that in order to achieve composite reliability (CR), the value of CR must be ≥ 0.6.

Table 2 shows the standardized item loading, average variance extracted (AVE), composite reliability (CR) and Cronbach alpha (CA) values. Majority of the factor loadings were larger than 0.6 except for Cost3 (0.48). Thus, Cost3 has been deleted. The AVEs for all constructs exceed 0.5 and CRs exceed 0.7. As listed in Table 4, below are the items that

were recommended and the actual values of some fit indices. Overall, the values of the items were better than the recommended values. When the values meet the recommended level for fit indexes, the construct validity is achieved. "Three categories of model fit are normally used to assess a model fit in SEM. There are absolute fit, incremental fit, and parsimonious fit" (Zainuddin Awang, 2015).

Table 2: Standardized item loadings, AVE, CR and Alpha values

Factor	Item	Item loadings ≥.60	CA ≥.70	AVE ≥.5	CR ≥.6
CONT	Con1	.643	.939	.553	.783
	Con2	.912			
	Con3	.643			
COST	Cost1	.937	.810	.918	.957
	Cost2	.979			
	Cost3	deleted			
MONETARY	Mo1	.897	.898	.751	.900
	Mo2	.840			
	Mo3	.861			
TECHNOLOGY	Tec1	.673	.889	.621	.891
	Tec2	.757			
	Tec3	.854			
	Tec4	.823			
	Tec5	.820			
ADOPT	Att1	.920	.850	.656	.850
	Att2	.718			
	Att3	.778			

The correlation of each construct has also been examined (see Table 3). The results indicated that the square root of AVE for each construct was greater than the correlations between itself and all other constructs, implying that there existed discriminant validity for each construct. In addition, the variance of each construct was larger with itself than with other constructs and exceeded the acceptable level of 0.5.

Table 3: Measurement Model: Discriminant Validity and Correlations

	CONT	COST	MONE-TARY	TECH-NOLOGY	ADOPT
CONT	.75				
COST	.38	.96			
MONE-TARY	.14	.32	.87		
TECH-NOLOGY	.05	.04	-.05	.79	
ADOPT	.35	.51	.39	.08	.81

Hair et al., (2006) indicated that under the absolute fit, the χ2 test showed p-value=.000, applicable for large sample size (more than 200). Joreskog and Sorbom (1996) claimed that the (χ2/d.f) was below 5.0 showed acceptable fit. The standardized root mean square residual (SRMR) was lower (.01) than the acceptable upper bound of .08. The root mean square error of approximation (RMSEA) showed a good fit value (.078) because it is below the recommended value of .08 (Bentler & Bonnet, 1980). The adjusted GFI (AGFI) showed a good fit value (.91) because it is greater than .90 (Tanaka & Huba, 1985). The normed fit index (NFI) (.93) exceeds the lowest recommended value of .90 (Bollen, 1990). Tucker–Lewis index (TLI) showed greater value (.93) than the suggested value of .90 (Bentler & Bonnet, 1980) and the comparative fit index (CFI) was greater (.94) that the recommended lower bounds of .90 (Bentler & Bonnet, 1985). Meanwhile, the parsimonious goodness of fit index (PGFI) was greater (.63) than the suggested level of .5 which indicated a good result. The parsimonious normed fit index (PNFI) and the parsimonious comparative fit index (PCFI) were both higher (.73, .74) than .5 which signified a positive fit model (Mulaik et. al., 1989). The fit indexes in this study were acceptable, therefore the analysis of the hypotheses can proceed.

Table 4. Fit indexes

Fit Index	Values	Fit indexes for the structural model
Absolute fit measures		
χ2	389.491	The lower the better
d.f.	94	
p-Value	.000	>.05
χ2/d.f.	4.144	<5
GFI	.913	>.90
SRMR	.010	<.08
RMSEA	.078	<.08
Incremental fit measures		
AGFI	.875	>.90
NFI	.928	>.90
TLI	.929	>.90
CFI	.944	>.90
Parsimonious fit measures		
PGFI	.631	>.50
PNFI	.727	>.50
PCFI	.740	>.50

Analysis of Structural Model

The objective of the current study has identified that unique or specific attributes of Internet TV (content, cost, monetary, and technology benefits) have a positive and strong relationship with Internet TV adoption on TV news. The hypotheses effects were measured using the coefficients. The results as shown in Table 5 indicated that content related attributes have a positive and significant effect on adoption (β = .170, p<.001). Thus, H1 was supported. Cost indicated a positive and significant effect on adoption (β=.361, p<.001). The monetary also indicated a positive and significant effect on adoption (β=.251, p<.001). Thus, H2 and H3 were supported. In addition, technology attributes showed a positive and

significant effect on Internet TV adoption. Therefore, H4 was supported. The Internet TV specific attributes explained 34.6% of the total variance in intention to adopt (R2=0.346). The strong statistical evidence support hypothesis 2 (β=.361) and hypothesis 3 (β=.251). Therefore, the second hypothesis showed that cost efficiency has contributed highly (β=.361) and significantly (p<.001) towards adoption.

Table 5: Hypotheses and Results

Path	Relationship	β	S.E	C.R	P. value	Hypothesis Results
H1:	Cont→Adoption Intention	.170	.053	3.663	***	Supported
H2:	Cost→Adoption Intention	.361	.040	7.742	***	Supported
H3:	Monetary→Adoption Intention	.251	.057	5.633	***	Supported
H4:	Technology→-Adoption Intention	.165	.041	3.334	.002	Supported

Note: β= estimates; SE= standard error of the regression weight; CV=critical ratio value for regression weight. ***p=.000
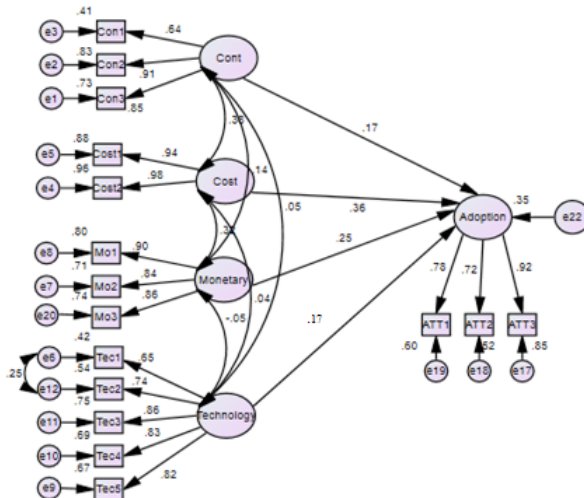

Figure 2: The path coefficients between constructs of Internet TV news adoption

Discussion and Conclusion

As presented in the conceptual framework, the researchers have combined and incorporated these distinctive attributes namely content, cost, monetary and technology. Internet TV can be considered as the latest digital or online content service which offers interactive innovative features. The Internet TV's specific attributes which fall under new medium are proven to be one of the important factors influencing students to adopt. The results are consistent with the previous studies by Lee et al., (2011) in their study on IPTV adoption. The results also confirm that content selectivity and quality are among the factors that influence people to adopt. Cost-related attributes which consist of time and effort efficiency are proven to be a major indicator of adoption in this study. This is consistent with Ewe, Yap, and Lee (2014) which found that cost has continuously been a driving strength behind the adoption of innovation. Meanwhile, monetary benefits showed a positive and significant relationship supported by Syed et al., (2015) in their study on e-commerce adoption in Malaysia. They had identified that the internet costs, easy link with sellers and customers, time barriers exclusion and global existence are the factors that influence people to adopt. The last attribute which is technology, also showed a positive and significant effect on adoption. This is supported by Lee et. al. (2011, 3) who stated that "IPTV delivers live and on-demand contents over a broadband connection, enabling a more customized and interactive user experience".

This study is one of the methods to investigate students' acknowledgment and response to Internet TV news and current issues in learning purposes. Based on past research and literature review on innovation and technology adoption, this paper suggests that perceived attributes of innovation and technology such as Internet TV is reported as one of the useful frameworks in understanding people's behavior in adopting new technology. Thus, the Internet TV's specific attributes (content, monetary, cost, and technology benefits) which falls under new medium are proven to be better than traditional TV. Furthermore, the unique attributes of Internet TV are more convenient to use compared to traditional TV (Dzaa Imma, Megat Al-Imran Yassin, Aziyah Abu Bakar et al., 2017). Thus, students can access anywhere regardless of time and place.

For future studies, the role of Internet TV's specific attributes should emphasize the need of other constructs that represent the main importance of Internet and television as a mobile entertainment and its usage to users such as relative advantage that has been discussed in the Diffusion of Innovation theory by Roger (2003). Past research on innovation and technology has found that relative advantage is one of the best predictors of the rate of innovation adoption (Lee et. al., 2011 & Singh & Kumar, 2018). The existence of mediator variable suggests that satisfaction (relative advantage) derived from the Internet TV use on specific attributes such as content, cost, monetary and technology may influence users' intention to adopt Internet TV. In addition, this study may contribute to media technology aimed at learning environment. In conclusion, the results are important to educators and students in enhancing the innovative format of teaching through Internet TV or known as "on-the-go" which offers local and international TV news.

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