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Internet cognitive failure relevant to self-efficacy, learning interest, and satisfaction with social media learning

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ABSTRACT

Social media has been postulated as a convenient online resource tool for learning. To understand the usefulness of social media, the present study focused on "Guitar Class of Uncle Ma", one of YouTube's most popular guitar learning channels in Taiwan, as a self-directed learning tool. Drawing upon a cognitive-affective theory of learning with media (CATLM), learners have the ability to control the pace of learning through YouTube by repeating playback, rewinding or fast forwarding the video. This study used expectation confirmation theory and structural equation modeling to explore the relationship between affective and cognitive factors in learning with social media. Using convenience sampling, data from 117 users were collected and the results showed Internet cognitive failure (ICF) was negatively correlated to self-efficacy and learning interest in using "Guitar Class of Uncle Ma" for learning guitar skills. However, self-efficacy and learning interest was positively correlated to learning satisfaction. The results suggest that "Guitar Class of Uncle Ma" is a beneficial self-directed learning tool for learners with low levels of Internet cognitive failure and high levels of self-efficacy and learning interest when learning how to play guitar using YouTube.

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1. Introduction

Improvements in web-based technologies have increased the use of interactive social media that enables users to upload images and videos on the Internet. Social media also acts as a channel for people to connect without physical and time limitation (Lenhart, Purcell, Smith, & Zickuhr, 2010). That is, social media has the potential to promote personal learning willingness as a promising new pedagogical approach to enhance learning effect (Dabbagh & Kitsantas, 2012). Among those social media, YouTube was discovered to be one of most commonly referred to resource utilized in education (Balakrishnan, Liew, & Pourgholaminejad, 2015). You-Tube is a video-sharing website, which allows users to upload, share, view, and rate videos with comments (Everson, Gundlach, & Miller, 2013; Lehman, DuFrene, & Lehman, 2010). Burke and Snyder

(2008) showed that learners have advocated that YouTube enhances the learning experience and increasing user numbers on YouTube has helped to transform it into a platform of education, teaching, and a learning environment (Snelson, Rice, & Wyzard, 2012; Szeto & Cheng, 2014). In particular, YouTube has become a learning tool with user-uploaded videos that demonstrate how to play musical instruments (Lewis & West, 2009; Livingstone, 2008). Despite the popularity of YouTube, there has not been extensive assessment related to learners' cognitive and affective factors in using it to learn musical instruments.

To assess the effectiveness of multimedia learning, Moreno (2006) proposed the cognitive-affective theory of learning with media (CATLM). Thus, the present study adapted CATLM to explore the effect of using YouTube to learn guitar skills. According to the attention-to-affect model (Critcher & Ferguson, 2011; Satpute, Shu, Weber, Roy, & Ochsner, 2013), learning is an emotional and cognitive experience (Frijda, 1986). In this cognitive experience, cognitive failure can cause absent-mindedness and failure of attention (Forster & Lavie, 2007; Tipper & Baylis, 1987). Consistent with this, cognitive failure may also reflect a decrease in the

efficiency of perceptual levels of Internet learning (Hong, Hwang, Liu, Ho, & Chen, 2014). At present, there is limited evidence to indicate how resultant cognitive failure in social media usage is manifested physiologically or behaviorally. This study extends cognitive failure during Internet usage as Internet cognitive failure (ICF) and focused on how it correlates to other affective perspectives.

When utilizing social media in learning, learners have the choice of what, when, and how long to study. These self-directed aspects of learning play important implications in the effectiveness of the user's learning efforts (Tullis & Benjamin, 2011), which in turn can extend interest. In this sense, the implication of CATLM paved the way to study interest in learning with social media and possible correlations of learning satisfaction with social media. Moreover, Di Stasi, Antolí, and Cañas (2013) stated that individual differences in cognitive traits could be used to predict the variability of cognitive processes in relation to affective responses during human-–computer interaction. In line with CATLM, the purpose of this study was to develop a conceptual framework to identify the cognitive role that internet cognitive failure plays to affect two affective factors (i.e., self-efficacy in learning a musical instrument from social media and interest in learning with social media) and how it reflects another affective factor, learning satisfaction with social media.

1.1. Internet cognitive failure (ICF)

Cognitive failure can be defined as a mistake in performing an action that a person is normally capable of completing (e.g., Wallace, Kass, & Stanny, 2002). Cognitive failure has been extended by Hong et al. (2014) to ICF to understand the interplay between cognitive and affective factors. Cognitive ability has also been recognized to be one of the most important factors for analyzing individual performance in dynamic learning systems (Laughery, Lebiere, & Archer, 2006). Moreover, an individual's cognitive ability can easily affect their choice of social media for learning (Laughery et al., 2006). Cognitive failure has been recognized as a key antecedent of behavior in particularly complex and unstructured tasks (Cohen, McClure, & Yu, 2007; Stemme, Deco, & Busch, 2007). Seldom have studies focused on how the human cognitive system interacts with hypermedia to search for information. In line with this, by using social media as a dynamic learning system, understanding how learners obtain domain knowledge in relation to the internet environment is the interest of this study.

1.2. Interest in learning with social media (ILSM)

Theories of motivation propose that interest can moderate difficulty when students are engaged in learning (Csikszentmihalyi, 1991; Deci & Ryan, 1985). In general, emotional engagement encompasses affective states that are experienced during learning, including achievement emotions and interest (Fredricks, Blumenfeld, & Paris, 2004; Pekrun & Linnenbrink-Garcia, 2012). Educational institutions should look into the possibility of incorporating social media enabled tools to improve students' learning experiences (Balakrishnan et al., 2015). According to Hidi and Renninger (2006), interest serves as a source of task value. Rotgans and Schmidt (2014) highlighted that if learners have more interest in learning, the learning system and course material would support the learners more easily. Moreover, online learning interest predicts learner's satisfaction with a learning system (Dziuban, Moskal, Kramer, & Thompson, 2013) and in this sense, interest in learning with social media (ILSM) would be taken to predict the learner's satisfaction with using social media in this study.

1.3. Self-efficacy of learning musical instruments from social media (SELMISM)

Self-efficacy is defined by Bandura (1977) as a basic belief in one's ability to exercise control over challenging demands and over one's functions. As self-efficacy beliefs are task specific, a person with high self-efficacy will tend to exhibit certain positive personal qualities such as persistence, strategic planning and high achievement (Bandura, 1997; Zimmerman, 2000). Learning a musical instrument depends on a high degree of autonomy. As such, investigating self-efficacy beliefs may reveal insights about the learners' approaches to learning (Ritchie & Williamon, 2011). Social media platforms also have the potential to enhance students' self-efficacy in learning and can support students to develop their learning to a deeper level (Tower, Latimer, & Hewitt, 2014). However, few studies have used the Expectation-Confirmation Model (ECM) to study a learner's task specific self-efficacy, which is defined as the self-efficacy in learning a musical instrument from social media (Stone & Baker-Eveleth, 2013). Thus, SELMISM will be taken to predict the learner's interest and satisfaction with using social media in this study.

1.4. Learning satisfaction with social media (LSSM)

Student satisfaction is important in the evaluation of educational courses as it is related to the quality of online programs and student performance (Chang & Smith, 2008). Learning satisfaction, one of the affective factors of CATLM (Moreno, 2006), is defined as a "short-term attitude that results from an evaluation of a student's educational experience and results when the actual performance meets or exceeds the learner's expectations" (Elliott & Healy, 2001, p.2). Information system (IS) has been used to develop many satisfaction measurements, which are grounded in the ECM (e.g., Bhattacherjee, 2001; Stone & Baker-Eveleth, 2013). Hence confirming expectancy is extremely essential for stakeholders to continue undertaking a particular behavior and this study used ECM to examine the users' satisfaction after learning guitar skills from YouTube.

2. Research hypothesis

YouTube allows users to upload videos that can be shared with a large audience. YouTube also offers convenient functions such as pausing, maximizing the screen size, or fast forwarding to a specific point in the video. When an individual engages in self-learning, they have the ability to adapt learning from specific scenarios in the video. Thus, one can easily return to any point in a video clip and practice a certain part as many times as desired (Heisz, Shedden, & McIntosh, 2012). However, the multiple components of YouTube require individuals to process, store, and retain information while performing multiple tasks and individual traits can affect how learners choose to use media to engage in their learning process (Merriam, 2008). Research suggests that a range of measurement-related variables moderate the attitude-intention-behavior relationship based upon the ECM (Ajzen, 2001). Accordingly, the hypotheses proposed are outlined below.

2.1. Internet cognitive failure relevant to self-efficacy

Several studies (e.g., Forster & Lavie, 2007) have indicated that post-perceptual levels of selective attention are less efficient for participants who have high cognitive failure. Recent experiments (e.g., Di Stasi, Antolí, Gea, & Cañas, 2011) have demonstrated that cognitive ability affects the understanding of hypertext contents. Given the presence of these features in learning guitar available on

social media, the structure and content of YouTube offers a greater degree of user control because the learner has to determine and shift the content choices that place additional demands on cognitive executive functions (Klois, Segers, & Verhoeven, 2013). In contrast to any other forms of online learning, a decrease in the deployment of cognitive resources likely reflects high ICF. However, ICF and belief in self-efficacy in learning with social media can influence what people think, the goals they set, the effort they exert into personal interactions, and the situations they select (Berger & Karabenick, 2011). That is, ICF may affect learners who have various beliefs in self-efficacy in learning with YouTube. Thus, the hypothesis related to the correlation between ICF and SELMISM is proposed as follows:

H1. Internet cognitive failure is negatively correlated to self-efficacy in learning a musical instrument from social media

2.2. Internet cognitive failure relevant to interest in learning with social media

The executive attention theory of working memory postulates that individuals have the ability to keep information in mind, which helps the mind to focus (Engle, 2002). Any performance deficits due to multitasking would depend on the extent to which those tasks required executive attention (Conard & Marsh, 2014). According to the theory, learners' executive functions for online tasks such as learning with YouTube must adapt to different strategies for changing learning demands. Learning interest is positively related to intrinsic motivation to cope with long-term retention of information (Müller & Louw, 2004). Thus, ICF in social media may or may not inhibit the brain's functional connectivity and in turn, learning interest may vary accordingly. In this case, ICF can serve as the antecedent of learning interest when using social media as a learning tool for learning to play a musical instrument. Thus, the hypothesis is proposed as follows:

H2. Internet cognitive failure is negatively correlated to interest in learning with social media.

2.3. Interest in learning with social media relevant to self-efficacy

Students may find interest in their current learning if they experience feeling good (Tice & Bratslavsky, 2000). As a widely-studied self-belief variable, self-efficacy along with interest should be taken into account to design online learning (Thadani, Breland, & Dewar, 2015). Self-efficacious individuals are more willing to participate in tasks and have more interest to confront difficulties than individuals who have less self-efficacy (Bandura, 1997a,b; Pajares, 1996). For online learners, exploration has also been associated with high interest (Sansone, Smith, Thoman, & MacNamara, 2012). Thus, the present study briefly considers the relation between interest and self-efficacy when using social media to learn guitar skills.

H3. Self-efficacy of learning a musical instrument from social media is positively correlated to interest in learning with social media.

2.4. Interest and self-efficacy relevant to learning satisfaction

Moreno's (2006) cognitive-affective theory of learning with media postulated the interplay between affective and cognitive factors in learning with media. Park, Flowerday, and Brünken (2015) argued that interest facilitates cognitive processing and improves affective outcomes. Liaw and Huang (2013) found that perceived satisfaction was affected by individual psychological factors such as learning interest. Moreover, satisfaction level is defined as the pleasure or contentment that one feels after performing an assigned task or desired action (Shee & Wang, 2008). In line with this Sansone et al. (2012) posited that when individuals are motivated by interest, they are more likely to persist in completing a task and be satisfied with activities they have completed. As such, interest in learning guitar skills through social media may predict satisfaction. Thus, the hypothesis proposed is as follows:

H4. Interest in learning with social media is positively correlated to learning satisfaction with social media.

Self-efficacy has continued to gain attention with respect to music learning (Ritchie & Williamon, 2011). However, McCormick and McPherson (2003) supported the importance of self-efficacy beliefs during learning and suggested that self-efficacy beliefs play a causal role in learner achievement and are predictive of learner effort and satisfaction with the learning materials. According to ECM empirical results, satisfaction and prior behavior impact continuance intention to use IS, which is moderated by IS self-efficacy (e.g., Lee & Kwon, 2011; Limayem & Cheung, 2008). As such, the present study explores whether self-efficacy of learning a musical instrument from YouTube can predict learners' LSSM and ILSM. Hence, the hypothesis is proposed as follows:

H5. Self-efficacy of learning a musical instrument from social media is positively correlated to learning satisfaction with social media.

2.5. Research model

Navimipour and Zareie (2015) highlighted that four variables (i.e., technology, educational content, motivation, and attitude) significantly influenced users' satisfaction. Users' satisfaction refers to an overall evaluation of an IS, which reflects an emotion-based response about the target IS that can be examined by ECM (Lam, Shankar, & Erramilli, 2004). ECM is widely used to explore user behavior in an IS post-adoption environment (Kim, 2010). Accordingly, this study evaluates learners' LSSM by examining learners' characteristics (i.e. ICF) mediated by ILSM and SELMISM. The research model proposed is shown in Fig. 1.

3. Research design

YouTube is considered as the third major social media site, following Facebook and Twitter (Auger, 2013). Lee (2014) emphasized the use of video clips from YouTube in the classroom as a systematic teaching tool to improve learning. Past studies related to the use of YouTube have focused mainly on academic achievement, and few studies have been conducted on using YouTube for musical instrument learning purposes (Ham & Schnabel, 2011). Therefore, further studies are required to determine if this form of social media is beneficial for learning musical instruments. Accordingly, four constructs present in the research instruments guide this study.

3.1. Research setting

The higher the quality of services offered through social media, the better the user satisfaction, learner expectations, and perceptions of service quality (Petruzellis, D'uggento, & Romanazzi, 2006). Social media provides a platform for people to communicate, share,
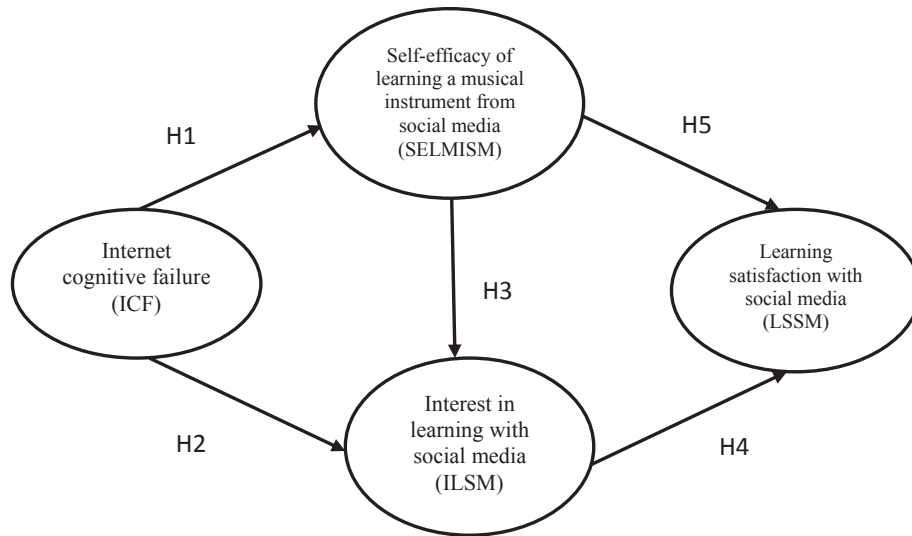
Fig. 1. Research model.

and make connections with others in a virtual community. According to Kietzmann (2008), social media utilizes the fast flow movement of web technology to allow individuals to share ideas via interactions in cyber space.

YouTube is acknowledged to be the premier choice for viewers among similar websites, and it has inspired millions of creative productions. Many researchers today even use YouTube as an interactive space for research purposes. Studies have been conducted on using YouTube for academic instruction (e.g. architecture) (Ham & Schnabel, 2011). For example, in one such study, online interactive learning was examined by observing viewers of dance tutorial clips from YouTube (Spurling, 2014). The present study uses a guitar tutorial program from YouTube as the basis of research into social media to increase the understanding of learner satisfaction. The guitar tutorial program "Uncle Ma" on YouTube was selected as it is the most popular guitar tutorial YouTube channel in Taiwan. By observing learners' interactions with Uncle Ma's guitar tutorial course, we examined learners' ICF and analyzed correlations between the variables of this study.

3.2. Data collection and participants

The data for this study was obtained from a questionnaire distributed to individuals who used Guitar Class of Uncle Ma on YouTube. Vogt (2007) confirmed that convenience sampling remains the most common form of sampling in contemporary social science research. According to the principle of convenience sampling, three individual participants were selected and given the opportunity to check the transcription of questionnaire for accuracy, to rectify mistakes, and to add aspects that may have been left out. Through this process, misinterpretations could be eliminated (Karnieli-Miller, Strier, & Pessach, 2009, p.284). All of the above contributes to the credibility of the research. The questionnaire was distributed to people we know (including family, friends and colleagues living in Taiwan), who had experience with Guitar Class of Uncle Ma on YouTube. The questionnaire was written in Chinese and distributed via e-mail and collected after 3 weeks. At the start of the questionnaire, participants were informed they had the right to end the questionnaire at any time and their anonymity would be ensured.

Of the 120 questionnaires collected, three were ineffective and 117 (93%) were valid and taken into consideration. 75 of the samples were male and 42 were female. On age difference, 41 participants were under 20 years-old, 53 participants were between 21 and 25 years-old, and the remaining 23 participants were above 26 years-old. The age distribution indicated most learners were primarily in their schooling years. Regarding the experience of using social media to learn a musical instrument, 42 participants had less than one year of experience; 26 had between one and two years of experience; 16 had between two and three years of experience; and 33 had more than three years of experience (see Table 1).

3.3. Measuring questionnaire

The present research aims to use a reliable, validated measure to assess the individual traits of social media learners and adapted measurements from previous studies. All constructs were measured using multiple items and were fully anchored using a five-point Likert-type scale that ranged from "strongly disagree" to "strongly agree".

3.3.1. Learning satisfaction with social media measurement

The items referred to the questionnaire proposed by Lin (2008) and Song and Zinkan (2008). Social media learning satisfaction was measured by the itemized rating scale capturing the level of satisfaction with the social media usage experience.

3.3.2. Self-efficacy of learning a musical instrument from social media measurement

This study adapted and tested the Self-Efficacy for Musical Learning questionnaire (Ritchie & Williamon, 2011). Items to measure learners' learning satisfaction were also adapted from Wang (2003), which indicated that learning satisfaction represented a manifestation of learners' learning experiences and explained their retention in different settings.

3.3.3. Learning interest with social media measurement

This was devised based on the definition of situational interest proposed by Hidi and Renninger (2006), namely, "situational interest refers to focused attention and the affective reaction that is triggered in the moment by environmental stimuli, which may or may not last over time" (p. 113). In line with this, fun or enjoyment was integrated in this measurement.

Table 1
Classification of participant backgrounds.

Variable	Category	Number	Percentage
Gender	Male	75	64.1%
	Female	42	35.9%
Age	Below 20	41	35.0%
	21–25	53	45.3%
	Over 26	23	19.7%
Years of experience with using social media to learn a musical instrument	1 year or less	42	35.9%
	1–2 years	26	22.2%
	2–3 years	16	13.7%
	3 years or more	33	28.2%

3.3.4. Internet cognitive failure measurement

The five items were adapted from the scale originally used in the Cognitive Failures Questionnaire by Broadbent, Cooper, Fitzgerald, and Parkes (1982). For validation purposes, it is an established measure for assessing slips and inattention that occur in everyday life. Based upon the functional mechanisms of YouTube, those items related to Internet cognitive failure are listed in Table 2.

4. Results

Confirmatory factor analysis was first applied to test reliability and validity of the measuring questionnaire. Then, structural equation modeling with partial least squares (PLS) was used to verify the research model.

4.1. Reliability and validity analyses of questionnaire

In the original questionnaire, there were seven items for the ICF construct, five items for SELMISM, seven items for ILSM, and seven items for the LSSM construct. After applying confirmatory factor analysis, items where the residual value was over .5 were canceled (Hair, Black, Babin, & Anderson, 2009). The remaining items were kept in this questionnaire, which contained five items for the ICF construct, four items for SELMISM, five items for ILSM, and five

items for the LSSM construct. The reliability and validity of questionnaire were analyzed as follows.

The factor loadings, the composite and internal reliability, and the convergent and construct validity of the questionnaires were assessed. With respect to the composite reliability analysis, the study used Cronbach's α together with the composite reliability (CR) to evaluate the consistency of the internal model. According to Nunnally (1978), Cronbach's α reaches its threshold if it exceeds .7. Hair et al. (2009) also suggested that composite reliability should be above .7. If Cronbach's α exceeds .7, then the construct has reached internal consistency. As seen in Table 3, the CR of the sample results was between .789 and .919, which is above the essential threshold of .7. Cronbach's α was also greater than .7, which suggests that the questionnaire demonstrated a certain level of reliability and that each construct measurement variable attained internal consistency.

Table 3
Cronbach's α, CR, Average, and AVE.

Constructs	Mean	SD	Cronbach's α	CR	AVE
ICF	2.558	.960	.889	.919	.843
SELMISM	3.362	.864	.712	.789	.789
ILSM	3.850	.806	.820	.875	.845
LSSM	3.948	.760	.851	.894	.824

Table 2
Factor loading, mean and standard deviation.

	Mean	SD	Factor loading
Internet cognitive failure:			
1. I often misinterpret the meaning of the message so that I must read the message again.	2.631	.829	.787
2. I often have difficulty finding the information I need on the webpage.	2.754	.959	.737
3. If there are too many messages on the screen, I always experience inability to see the information, even though it is actually there.	2.617	1.032	.759
4. I often miss the location of what I post on the internet.	2.482	.957	.769
5. I often forget what message I posted.	2.307	1.021	.734
Self-efficacy of learning a musical instrument from social media:			
1. I can find workable clips to review the parts I missed.	3.725	.744	.746
2. I can shift into different scenarios appropriately when using YouTube.	3.525	1.050	.670
3. I am aware of the options to change contents or speed when using YouTube.	3.116	.773	.679
4. I have confidence in adapting YouTube to situational change.	3.083	.931	.685
Interest in learning with social media:			
1. I enjoyed using YouTube to learn guitar skills.	3.959	.803	.722
2. I liked using YouTube to learn guitar skills.	3.992	.772	.707
3. I have fun learning guitar skills on YouTube.	3.967	.685	.785
4. I concentrate when learning to play the guitar using YouTube.	3.800	.836	.874
5. I felt that "time flies when I am using social media" to learn guitar skills.	3.534	.934	.725
Learning satisfaction with social media:			
1. The guitar tutorials on YouTube inspired me to learn more guitar skills.	4.192	.598	.742
2. The YouTube guitar tutorials solved past problems I had when learning guitar.	4.000	.766	.789
3. The interactive style of YouTube improved my guitar skills.	4.050	.720	.822
4. The guitar tutorials on YouTube make me want to continue learning from it.	3.766	.837	.795
5. I enjoy using YouTube with friends while we improve our guitar skills together.	3.733	.886	.816

Finally, each construct's average was between 2.558 and 3.948, and the standard deviation was small, which indicates that the internal reliability was high (Byrne, 2001) (see Table 2).

With respect to convergent validity, if the average variance extracted (AVE) for an individual construct convergent validity was greater than .5, the construct had sufficient convergent validity (Fornell & Larcker, 1981). In addition, when the variable, under the variable measurement condition factor is greater than .5, the convergent validity requirement is met (Nunnally, 1978). Table 3 shows that the AVE for the constructs was between .789 and .845, which indicates that all constructs in this study obtained convergent validity. Furthermore, when each construct measurement's corresponding acceptance level is greater than .5, it can be concluded that the measurement model in the study possessed convergent validity. In addition, the factor loadings of all items were significant and greater than .5 (Nunnally, 1978). All of these conditions were met, which indicates acceptable convergent validity (Hancock & Mueller, 2006).

4.2. Path analysis

In the verification step, this study adopted PLS for path modeling over the covariance-based SEM because PLS is used for confirmatory research to manage the component-based path analysis of the research model (cf. Hair, Sarstedt, Ringle, & Mena, 2012). After completing the PLS measurement medial effective test, we focused on analyzing the PLS model explanation and the predictive ability of the construction model.

First, the significance of pathway was identified from each route coefficient's value (cf. Hair et al., 2012). Fig. 2 shows hypotheses 1, 2, 3, 4, and 5 were all supported as follows: ICF was negatively correlated to SELMISM ($\beta = -.500$, $t = 7.492^{***}$); ICF was negatively correlated to ILSM ($\beta = -.301$, $t = 2.747^{**}$); SELMISM was positively correlated to ILSM ($\beta = .625$, $t = 6.487^{***}$) and LSSM ($\beta = .218$, $t = 4.069^{***}$) respectively; ILSM was positively correlated to LSSM ($\beta = .647$, $t = 6.893^{***}$).

Second, the direct effect between constructs was as follows: from ICF to SELMISM was −.500, from ICF to ILSM was −.301, from SELMISM to ILSM was .625, from SELMISM to LSSM was .218, and from ILSM to LSSM was .647. The indirect effect of ILSM from ICF through SELMISM was −.313. The indirect effect of LSSM was as follows: from ICF through SELMISM was −.109, from ICF through SELMISM and ILSM was −.202, from ICF through ILSM was −.195. The total effect of LSSM was .359.

Third, the explanatory ability of the model is mainly concerned with evaluating whether there are significant route coefficients between each research construct. That is, the predicted ability of the model could be determined by square multiple correlation (R^2). The result of this study revealed that the explanatory power of ICF on SELMISM was 45.3%, and on ILSM was 30.8%, and the explanatory power of SELMISM and ILSM on LSSM was 50.2%. From these results, we conclude that the variables in this study have decent predictive power (cf. Hair et al., 2012).

5. Discussion

As learning with social media on the Internet is undergoing major changes in accessibility, an understanding of learner satisfaction with social media based on ECM is crucial. In addition, CATLM highlights the essentiality of studying cognitive and affective factors (Moreno, 2006; Park, Plass, & Brünken, 2014). In other words, individual cognitive ability may take affective aspects into account (as explained in sections 1.1–1.4). In order to verify the research framework, this study developed a measuring questionnaire containing four constructs and applied confirmatory factor analysis. The present study tested the relationship between cognitive (i.e., ICF) and affective factors (i.e., SELMISM, and ILSM) as constructs that increase the predictive power of the LSSM. Results showed that increasing ICF will decrease learners' SELMISM or ILSM and increasing learners' SELMISM or ILSM will increase their LSSM.

In light of attitudes towards learning effectiveness, a set of complex cognitive functions, emotions, and behavioral tendencies is represented (Aldemir & Gulcan, 2004). People's exposure to certain information induces a cognitive response that will affect attitude formation (Huang, Su, Zhou, & Liu, 2013). Wilson and
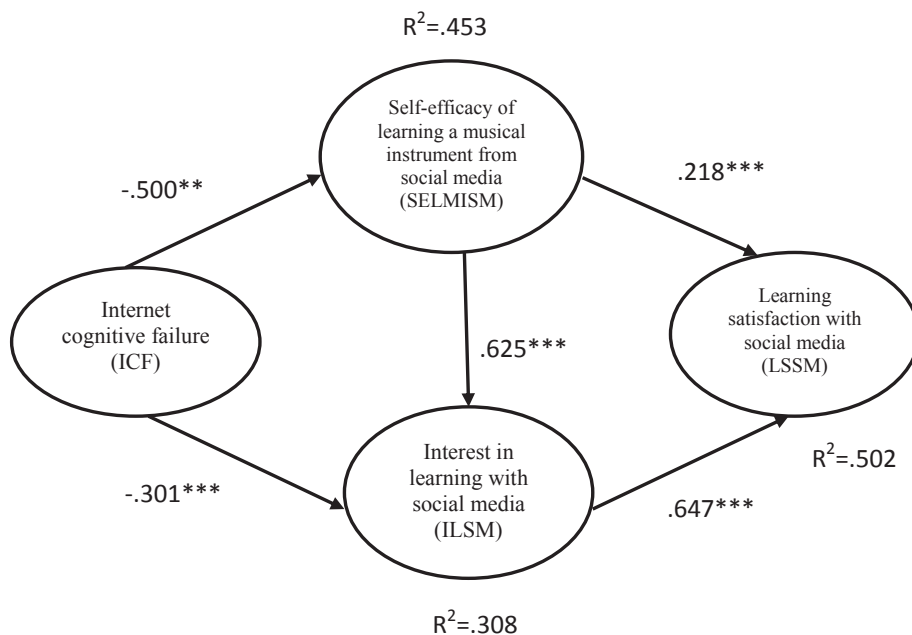

Fig. 2. Verification of research model.

Fowler (2005) found different cognitive ability affects the learning strategies based on deep and surface learning. Learners engaging in typical surface learning showed a low degree of variability in learning (Nijhuis, Segers, & Gijselaers, 2008). In contrast, deep learning requires interactivity that is fostered by decreases in cognitive failure when interacting with electronic content (Daniel & Woody, 2013). Supporting these assertions, the results of this research verified H1 (i.e., ICF is negatively correlated to SELMISM) and H2 (i.e. ICF is negatively correlated to ILSM). This reflects on high emotional and behavioral tendencies in terms of LSSM in accordance with ECM and demonstrates how ICF can be used as a basis for explanation relevant to social media learning.

The interest in online experience is the dynamic state that arises through an ongoing transaction among attitudes towards goal achievement, context, and action (Sansone, Thoman, & Smith, 2010). The learning interest measurement refers to reactions to a specific topic that is at the forefront of learners' attention. Zhang, Zhou, Briggs, and Nunamaker (2006) noted that learners who perceived learning interest tended to demonstrate positive attitudes towards learning results and exhibited high satisfaction. The results of this study verified H3 (i.e., SELMISM is positively correlated to ILSM), and thus indicated that learners' beliefs regarding their SELMISM have implications for their interest in searching for learning tasks using social media.

The results verified H4 (i.e., ILSM is positively correlated to LSSM). This finding is supported by Kolb, Rubin, and Osland's (1990) study, which stated that learners were likely to perceive their interest in learning effectiveness when the learning environment could easily transfer effective knowledge acquisition. In other words, when individuals are motivated by interest, they are more likely satisfied by working on the task (Sansone et al., 2012). That is, learners may perceive great challenges if their interest in learning with social media is a factor that hinders their development as efficient and skillful guitar players.

The learners' satisfaction levels can be measured based upon the degree of control users have over the social media and applicability of the course materials (Bollinger & Martindale, 2004; Elliott & Healy, 2001; Yoo, Lee, & Park, 2010). In line with ECM, the results of this study verified H5 (i.e., SELMISM is positively correlated to LSSM), and indicated that learner's satisfaction is determined by their prior self-efficacy. Similar results were also found in Kuo, Walker, Schroder, and Bella's (2014) research, which also supported that a reader's self-efficacy determines satisfaction while interacting with social media.

6. Conclusion

The present study focused on understanding the correlation of cognitive failure and other variables in relation to learning with social media. This study introduced ICF, an important construct relevant to the study of cognitive process and the result advances our understanding of relational dynamics by showing how ICF promotes or inhibits the relationship between learning interest and self-efficacy that can explain how individuals differ in their satisfaction with using social media to learn a musical instrument.

Social media can be used as an effective learning tool whereby students can adjust and control their learning pace (Mao, 2014). This study provides a strong example of the importance of contextualized approaches to use social media for learning and it also highlights the power of multilevel functions of YouTube. Thus, a related practical implication is the need for teachers to consider how individual characteristics can interact with aspects of social media learning. This may be particularly important for teachers to decide where to expend effort in searching for or developing YouTube content to encourage students to execute their learning,

particularly in contexts like learning to play a musical instrument.

Social media can provide a form of e-learning. It seems to be a promising solution for learners because the learning-on-demand opportunities will help to reduce the gap between individual needs and learning preferences (Wang, Wang, & Shee, 2007). Dewitte (2013) claimed that self-behavior, such as cognition and emotion, is difficult to alter due to the limited mental resources. Thus, this study points to a special research challenge: how to further integrate different learner characteristics, such as impulsivity and procrastination that can potentially affect learners' cognitive processes in social media learning environments.

González-Gómez, Guardiola, Martín Rodríguez and Montero (2012) studied gender differences in e-learning satisfaction and found that female learners were more satisfied than male learners in the learning process. Furthermore, they found that female learners regarded preparation for learning as being high importance and contacted their teachers through various means. Further studies can analyze the relationship between gender differences and attitudes towards learning satisfaction in the social media environment.

Age-related learning motivation is also an important but not well understood component of lifelong learning (Leen & Lang, 2013) in the social media context. Thus, further research on age-related changes in learning with social media is necessary. Improving understanding of learning motivation among learners of different age group may offer new insights into learning opportunities for social media.

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