Evaluating Perceived Service Quality, Perceived Playfulness, and Gratification towards User's Attitude of Mobile Instant Messaging Application

Prima Ayundyayasti[1]*; Arum Febriyanti Ciptaningtias[2]

[1]Computerized Accounting, Accounting, Politeknik Negeri Semarang
[2]Managerial Accounting, Accounting, Politeknik Negeri Semarang
Jl. Prof. Sudarto, Tembalang, Semarang, Central Java, Indonesia 50275
[1]prima@polines.ac.id; [2]arumfciptaningtias@gmail.com

Abstract - The research aimed to understand the behavior and adoption of mobile instant messaging (MIM) usage. By applying perceived service quality towards perceived playfulness and gratification model, the research investigated the factors related to MIM usage. Two most popular MIM applications used in Semarang, Indonesia, namely WhatsApp and LINE were targeted. After testing and validating the reliability and validity, questionnaires were distributed to university students and employees in Semarang, Indonesia whom already used MIM applications. The measurement of the constructs in the proposed model was confirmed with confirmatory factor analysis (CFA) to test the consistency of question items within each construct. The outcomes of the questionnaire were tested through structural equation modeling (SEM) to test whether the proposed constructs are confirmed to the designated model. Path coefficient and fit indices of the proposed conceptual model were also used to measure the possible relations between variables. The results show positive influences of perceived service quality, perceived playfulness, and gratification towards user's attitude.

Keywords: gratification model, mobile instant messaging, perceived playfulness, perceived service quality

I. INTRODUCTION

The way people communicate has changed with the advanced development of technology. Smartphones have become a favoured communication device due to its advantage in mobility and easiness. In Indonesia, which has more than 270 million of population, the popularity of smartphones has increased as well as internet based communication. Mobile instant messaging (MIM) and instant messaging (IM) are fundamentally communication platforms which rely on internet connection to allow user's access. While IM is generally designed for desktop PCs, MIM is specified for usage in mobile devices such as personal digital assistant (PDA), mobile phone, tablet, and so on. It simply needs your phone number or e-mail address and internet connection for registration. Even MIM developers do not only establish the mobile version, but also the desktop version to synchronize the messages and share media from mobile phone.

Equipped with various features, mobile instant messaging (MIM) takes over short message service (SMS) and phone call as a communication manner. MIM is very popular as it conveniently provides interpersonal communications. Internet connection on mobile devices is required to utilize MIM applications, opposed to SMS which required phone credit in every message sent. Numerous features such as text message, voice message, voice call, video call, group chat, user's status update, stickers, document, and multimedia transmission make MIM as a one stop communication platform and data sharing. As the use of MIM grows, researchers conduct studies related to the adoption and behavior of MIM utilization. In 2016, a researcher examined the use of MIM to support teaching and learning of Database course in higher education (So, 2016). Perceived playfulness is highlighted in the effect of social interaction of MIM (Hsieh & Tseng, 2017). The perspective of uses and gratifications of MIM were examined in nurses as a communication platform in health care service (Bautista & Lin, 2017). The study of retailer-consumer interaction using MIM was conducted in

China (Vazquez, Dennis, & Zhang, 2017). WhatsApp as an MIM application is used as a feedback tool of English foreign language class (Soria, Gutiérrez-Colón, & Frumuselu, 2020). Various MIM application is available to be downloaded on smartphone such as WhatsApp, LINE, Telegram, Messenger, MiChat, Discord, and so on. The research focus is particularly based on WhatsApp and LINE usage as the two most used MIM applications in Indonesia.

User's adoption towards technology depends on many factors. As mobile instant messaging gain popularity, the number of users of those applications grow as well. The research is conducted to identify user's adoption and behavior in using MIM application. The purpose of the research is to identify factors associated to attitude towards using MIM and the actual behavior of how the users utilizing the applications. MIM application developers could also utilize the research results to determine the factors influencing MIM adoption and possibly improve features provided in the application development. The research investigates perceived service quality towards perceived playfulness and gratification model to explore factors regarding to the use of MIM in Indonesia. The next section presents conceptual background as well as brief review of literature along with a proposed model of the research.

Technology acceptance model (TAM) was first introduced in 1989. Two specific variables, perceived usefulness and perceived ease of use were developed and validated which then hypothesized to be fundamental determinants of user acceptance (Davis, 1989). Perceived usefulness was defined by Davis (1989) as the extent which a person considers that using a specific system would increase job performance. Whereas Perceived Ease of Use was defined as the extent which a person considers using a specific system would not require a great effort. TAM was extended from Theory of Reasoned Action (TRA) proposed by Ajzen and Fishbein. It is believed as the most applied model for researches related to technology acceptance. A systematic review of TAM on social media was performed and the results showed that TAM was used as a primary theoretical model. Not to mention, the correspondence of the related studies were mostly students of higher education. (Al-Qaysi, Mohamad-Nordin, & Al-Emran, 2020). Other study of TAM applied psychological influence theory of conformity behavior and self-esteem in the extended model. WeChat application was used as the subject of research (Yu, 2020). MIM as a type of internet based social interaction using mobile device should show similar behavior towards social networking sites (SNS) and traditional instant messaging as a form of communication means. The research proposes integration of technology acceptance model, perceived service quality, perceived playfulness, uses and gratifications theory, and social influence as extended variables contributing user's adoption of MIM applications.

Perceived service quality is believed to have

an influence towards customer's loyalty, satisfaction, and motivation in using a service (Subrahmanyam, 2017). A research in regards to perceived service quality towards physician and user's satisfaction on mobile healthcare consultation was conducted in 2020 (Tan & Yan, 2020). The research adopts the conceptual model of Chou's research (Chou, 2006). Chou defines perceived service quality as the overall quality of services that user perceived or experienced. This definition refers to Chou's study towards mobile information and entertainment services which treat Perceived service quality as a multidimensional construct that combines underlying service attributes. The attributes mentioned in Chou's study referred to some of the constructs in Chung and Tan's study (Chung & Tan, 2004) regarding to website characteristics as antecedent of perceived playfulness. This research adopts experimentation, personalization, perceived usefulness, perceived ease of use, feedback, variety, content, and speed from Chou (2006) and Chung and Tan (2004) as antecedents of perceived service quality. The antecedents used in the research are simplified based on the characteristics of the attribute, thus makes perceived service quality as the second order factor. Experimentation, personalization, feedback, and content have a characteristic of reciprocal response between the user and application. Hence, the constructs are combined as interactivity construct. Variety and speed indicate characteristics of being related in functionality aspect. Both constructs are classified as practical attributes in MIM application. Variety in MIM application offers diverse services that can become the excellence of the application to attract users. Speed is related to the extent which MIM application can deliver information between the user and system as well as between other users. The functionality of variety and speed are then associated as feature construct.
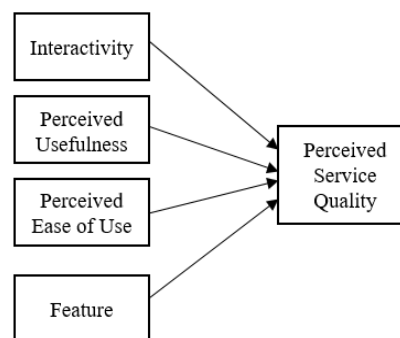

Figure 1 Perceived Service Quality Constructs

Gratification theory has been used in a lot of research. It is believed as one of the many factors why users continue to engage in an activity and utilize a service. Ghazali, Mutum, and Woon (2019) conduct research of user's gratification in the continuity playing an augmented reality game. Ha et al. (2015) apply gratification model in social networking sites. Ha et

al. (2015) point out variables related to gratification are: (1) cognitive, (2) hedonic, (3) integrative, (4) social interactive, and (5) mobile convenience. This research adopts gratification related variables from the research by Ha et al. (2015). Cognitive refers to the acquirement of knowledge and information through the content shared on MIM. Interactions with fellow users allow the procurement and information exchange that are expected to positively influence gratification of using MIM. Integrative related to individual's ability to develop self-identity, enhance social relations, and reputation from using MIM application. Communication with other users is the key aspect in obtaining integrative gratification. Hedonic gratification is related to the enjoyment and pleasurable sense from MIM adoption. This construct is considered of having a close implication with perceived playfulness. Hence, in the research hedonic gratification is taken down from Ha's conceptual model. Social interactive refers to whether someone feels convenient to participate in interpersonal communication interchange using technology. While mobile convenience is the easiness of using mobile instant messaging with minor effort. As MIM is distinguished in its mobility as a long distance communication platform, mobile convenience is one of the key features offered.
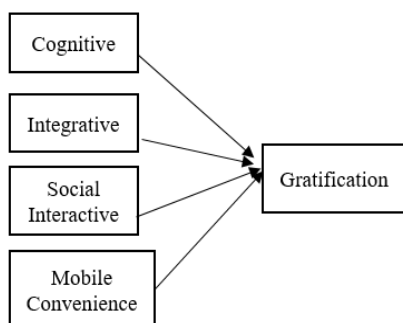

Figure 2 Gratification Constructs

Perceived playfulness was introduced by Moon and Kim (2001) as an extension of TAM in the context of World Wide Web (WWW). It has a role as a motivational characteristic of individuals and as a situational characteristic of the interaction between an individual and the situation. Moon and Kim (2001) define three dimensions of the perceived playfulness as: (1) concentration, (2) curiosity, and (3) enjoyment, in which individuals with positive playfulness would interact positively. Hung, Tsai, and Chou (2016) unravel perceived playfulness in user's adoption of social networking sites (Hung et al., 2016). Hung et al. (2016) argue that enjoyment, curiosity, and concentration are the superordinate constructs that form the concept of perceived playfulness. Playful experience of using a service leads to the sense of curiosity and users will be completely engaged. Thus, concentration is included as users are drawn in an activity that they enjoy. In the research, hedonic

gratification and perceived playfulness are believed to share the same characteristic of enjoyment as an emotional outcome in which individuals will find the interaction with MIM is interesting and their engagement in the activity is for pleasure.

Perceived service quality defines the extent to which individual perceived that MIM application's service quality is obtained from comprehensive attributes rather than single trait. The quality of service is believed to have an influence to the feel of satisfaction and enjoyment of perceived playfulness. The overall quality of service will play a role in the sense of fun, enjoyment, and hedonic to user's adoption of MIM application. Arcand et al. (2017) argue that hedonic dimension of a mobile service is also formed by the service quality.

Based on this explanation, the hypotheses are proposed:

H_1: Perceived service quality positively influences gratification.

H_2: Perceived service quality positively influences perceived playfulness.

H_3: Gratification positively influences attitude.

H_4: Perceived playfulness positively influences attitude.

Social influence is considered to affect individual's attitude and usage towards MIM (Beldad & Hegner, 2018). Beldad and Hegner (2018) believe that social influence related to an application's popularity that would captivate people to voluntarily use the application. Theory of reasoned action (TRA) implies that subjective norm and attitude influence individual's behavioral intentions, thus perceived social pressure influences individuals to engage in a behavior (Karnowski, Leonhard, & Kümpel, 2018). Social features related to social experience will have a consequence on consumer's engagement to use mobile application (Tarute, Nikou, & Gatautis, 2017). In MIM context, social influence will impact whether other people's opinion involving in individual's paradigm and the actual use of technology. Users' adoption of MIM may be determined by their individual need to apply the technology and also by the influence from other people. In the adoption, one user may have multiple applications due to their need to communicate with other user who employ certain MIM application. This will affect their behavior and attitude towards MIM application whether they think the application is usable and worth to use for long term communication platform. The popularity of an application is also determined by the number of users who utilize the application.

Based on this explanation, the following hypotheses are proposed:

H_5: Social influence positively influences actual use.

H_6: Attitude positively influences actual use.

The influence of perceived service quality towards perceived playfulness and gratification is analysed in the research to identify user's behavior towards MIM as communication platform.

II. METHODS

The data used in the research are collected by a questionnaire survey. The respondents consist of university students and employees to represent active users of MIM application. 321 responses from 150 employees and 171 university students are deemed usable in the research. Out of all the respondents, 167 respondents are female and 154 are male. The age range of the respondents is between 17 and 51 years old. Most of the students are in the age group of 17-23 years old with total of 145 respondents. Almost half of the employee respondents are in the age group of 24-30 years old with total of 64 respondents. This shows that most of the active users of MIM application are the younger generation (under 30 years old). WhatsApp is used by more users of both students and employees rather than LINE. A questionnaire is set up consisting of personal information such as age and occupation, individual's experience in using MIM, and questions related to the research constructs. A brief introduction on the purpose of the research and definition of MIM is included in the front page of survey questions. All of the constructs are measured using seven-point Likert scale with (1) represents "strongly agree" to (7) represents "strongly disagree".

The assessment of the measurement model is evaluated to determine internal reliability of items in the construct using Cronbach's alpha. All of the construct reliability in the research ranges from 0,728 to 0,891 as shown in Table 1.

Table 1 Construct Internal Reliability

Construct	Reliability
Interactivity	0,736
Feature	0,728
Perceived Usefulness	0,847
Perceived Ease of Use	0,854
Perceived Playfulness	0,804
Cognitive	0,782
Integrative	0,847
Social Interactive	0,766
Mobile Convenience	0,786
Social Influence	0,814
Attitude towards MIM	0,891
Actual Use	0,808

Confirmatory factor analysis (CFA) is used to evaluate model measurement. The second order factor of perceived service quality and gratification are tested initially. The results of the loading factor in second order factor loading are between 0,8 and 0,93. The number of factors and which factor each variable will load on correspond the theoretical concept of the constructs. The measurement theory in CFA is to specify the number of factors and which variables load on those factors.

III. RESULTS AND DISCUSSIONS

Structural equation modelling from AMOS software version 21 is used in the research to assess the goodness of fit of the proposed model. The evaluation for the goodness of fit score as recommended by Bentler and Bonnett (1980) and Segars and Grover (1993) shows that the fit indices score in this model indicates an acceptable model fit. Some modifications are suggested to improve the goodness of fit score. However, the suggestion is considered not fitting the theoretical background of the research. The fit indices score of the proposed model is shown in Table 2. The results for Comparative Fit Index (CFI), Goodness of Fit Index (GFI), and Root Mean Square Error of Approximation (RMSEA) have met the recommended criteria. Whereas the Adjusted Goodness of Fit Index (AGFI) score is 0,767 which is slightly below the criteria of 0,80. However, the difference in the score is considered close to the 0,80 criteria, hence this score is acceptable for model fit.

Table 2 Fit Indices

Fit indices	Recommended score	Results
GFI	$\geq 0,80$	0,819
AGFI	$\geq 0,80$	0,767
CFI	$\geq 0,90$	0,903
RMSEA	$\leq 0,1$	0,092

The purpose of the research is to understand users' attitude and behavior regarding MIM application by evaluating the influence of perceived service quality towards perceived playfulness and gratification model. The research proposed six hypotheses regarding to the use and behavior towards MIM applications. The results of the proposed hypotheses indicate positive relations of the hypotheses. Hypotheses testing are assessed with path analysis in the structural equation modelling. The hypotheses testing result is shown in Table 3.

H_1 evaluates whether perceived service quality has positive influence towards gratification with the standardized estimates of 0,074. This verifies that the overall service quality that users feel influences the satisfaction of using MIM application. Thus, perceived service quality positively influences gratification. H_2 presents positive influence of the relation from perceived service quality towards perceived playfulness with standardized estimates score of 0,135. Thus, the proposed hypothesis is supported positively.

In H_3, gratification is expected to have positive influence towards attitude of MIM usage. This hypothesis is supported with standardized estimates

Table 3 Path Coefficient

Path	Proposed relation	Estimate	Standard Errors	Testing hypothesis
H_1: PSQ → Gratification	Positive	0,683	0,074	Supported
H_2: PSQ → PP	Positive	0,541	0,135	Supported
H_3: Gratification → Attitude	Positive	0,362	0,076	Supported
H_4: PP → Attitude	Positive	0,215	0,044	Supported
H_5: SINF → Attitude	Positive	0,480	0,055	Supported
H_6: Attitude → Actual Use	Positive	0,810	0,053	Supported

score of 0,076. According to Ha et al. (2015), regarding the influence of gratification towards user's attitude also indicates a positive impact. Perceived playfulness also positively influence attitude as proposed in H_4. It is supported with the score of standardized estimates of 0,044. The result of H_4 coincidentally reflects the result of perceived playfulness in the extended technology acceptance model (Moon & Kim, 2001). The proposed H_3 and H_4 are supported positively.

The relation of social influence towards attitude of MIM usage is evaluated in H_5. The research result indicates positive influence with standardized estimates of 0,055. As the popularity of MIM as communication tool is increasing, many people use it to connect and communicate with each other. H_6 conjectures positive influence of attitude in using MIM towards actual use of the application. H_6 is supported with positive standardized estimates score of 0,053. Thus, the proposed H_5 and H_6 are supported positively. The relation of attitude towards using with actual use of a technology is confirmed in TAM by Davis, as seen in Figure 3.
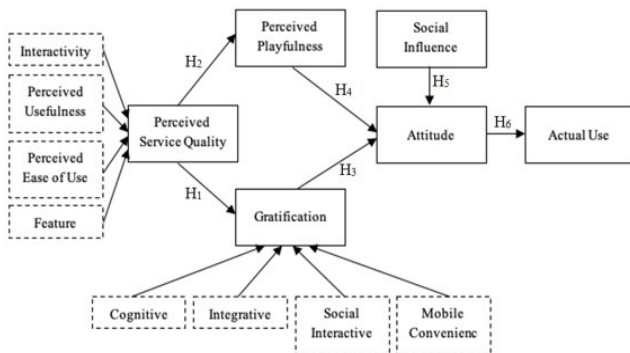

Figure 3 Proposed Conceptual Model

IV. CONCLUSIONS

The research has achieved the objective to evaluate perceived service quality, perceived playfulness, and gratification towards user's attitude in the context of MIM application by using Structural Equation Modelling (SEM). The measurement of the constructs in the proposed model is confirmed with Confirmatory Factor Analysis (CFA) to test the consistency of question items within each construct. Path coefficient and fit indices of the proposed conceptual model are also used to measure the possible

relations between variables. The research results contribute to some implications. First, the findings contribute the positive impact of perceived service quality towards gratification. Perceived service quality is measured by attributes consisted of interactivity, perceived usefulness, perceived ease of use, and features. Meanwhile, gratification is measured as overall gratifications of cognitive, integrative, social interactive, and mobile convenience aspects.

Second, the hypothesis of positive influence from perceived service quality towards perceived playfulness proposed by Chou (2006) is also confirmed based on the research findings. The findings imply that users' perception on the overall service quality in MIM application affect the sense of playfulness in the interaction with the application. Various features offered in the applications such as emoticon, stickers, voice call, video call, and user's status bring the fun experiment in the engagement with mobile instant messaging. Users can interact with others using the available features to enhance communication experience, rather than just simply chat using texts only. This corelates to the service given in the application could make users feel content during their interaction with other users on mobile instant messaging. Satisfaction of the users measured in gratification constructs affects attitude of using mobile instant messaging. The service quality of mobile instant messaging applications positively have a significant impact towards perceived playfulness and gratification during user's engagement with the applications.

The research has some limitations which might be explored for future research. First, users are required to participate in the questionnaire survey by their experience interacting with MIM application. Thus, a biased result may appear from the limitation of only users with the experience of interacting with mobile instant messaging. In addition, only students in the age range of 17-23 years old participate in this survey. Whereas a lot of younger students are also active users of MIM applications. Second, the research takes samples of respondents in one city, while it could have been done using larger data samples. The future research might use a larger sample in different cities to evaluate possible different nature or comparison of users' behavior in different area.

In addition, as the research contributed in the implication for the influence of perceived service

quality towards gratification, further research related to this hypothesis could be conducted in different context of behavior towards technology. The measurement of user's gratification in the technology adoption could be tested by perceived service quality. With the development of advanced technology, in which it could be completely new or modified from an existing technology, it could relate towards each other and influence users' adoption and behavior.

REFERENCES

Al-Qaysi, N., Mohamad-Nordin, N., & Al-Emran, M. (2020). Employing the technology acceptance model in social media: A systematic review. *Education and Information Technologies, 25*(6). 4961-5502. https://doi.org/10.1007/s10639-020-10197-1

Arcand, M., PromTep, S., Brun, I., & Rajaobelina, L. (2017). Mobile banking service quality and customer relationships. *International Journal of Bank Marketing, 35*(7), 1066-1087. https://doi.org/10.1108/IJBM-10-2015-0150

Bautista, J. R. & Lin, T. T. C. (2017). Nurses' use of mobile instant messaging applications: A uses and gratifications perspective. *International Journal of Nursing Practice, 23*(5), 1-9. https://doi.org/10.1111/ijn.12577

Beldad, A. D. & Hegner, S. M. (2018). Expanding the technology acceptance model with the inclusion of trust, social influence, and health valuation to determine the predictors of German users' willingness to continue using a fitness app: A structural equation modeling approach. *International Journal of Human-Computer Interaction, 34*(9), 882-893. https://doi.org/10.1080/10447318.2017.1403220

Bentler, P. M. & Bonnett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*(3), 588-606. https://psycnet.apa.org/doi/10.1037/0033-2909.88.3.588

Chou, P. C. (2006). *Understanding user's perceived playfulness toward mobile information and entertainment services in New Zealand*. [Master thesis, Auckland University of Technology]. New Zealand.

Chung, J. & Tan, F. B. (2004). Antecedents of perceived playfulness: An exploratory study on user acceptance of general information-searching websites. *Information and Management, 41*(7), 869-881. https://doi.org/10.1016/j.im.2003.08.016

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340. http://dx.doi.org/10.2307/249008

Ghazali, E. M., Mutum, D. S., & Woon, M. Y. (2019). Multiple sequential mediation in an extended uses and gratifications model of augmented reality game Pokémon Go. *Internet Research, 29*(3), 504-528. https://doi.org/10.1108/IntR-12-2017-0505

Ha, Y. W., Kim, J., Libaque-Saenz, C. F., Chang, Y.,

& Park, M. C. (2015). Use and gratifications of mobile SNSs: Facebook and KakaoTalk in Korea. *Telematics and Informatics, 32*(3), 425-438. https://doi.org/10.1016/j.tele.2014.10.006

Hsieh, S. H. & Tseng, T. H. (2017). Playfulness in mobile instant messaging: Examining the influence of emoticons and text messaging on social interaction. *Computers in Human Behavior, 69*, 405-414. https://doi.org/10.1016/j.chb.2016.12.052

Hung, S. Y., Tsai, J. C. A., & Chou, S. T. (2016). Decomposing perceived playfulness: A contextual examination of two social networking sites. *Information and Management, 53*(6), 698-716. https://doi.org/10.1016/j.im.2016.02.005

Karnowski, V., Leonhard, L., & Kümpel, A. S. (2018). Why users share the news: A theory of reasoned action-based study on the antecedents of news-sharing behavior. *Communication Research Reports, 35*(2), 91-100. https://doi.org/10.1080/08824096.2017.1379984

Moon, J. W. & Kim, Y. G. (2001). Extending the TAM for a World-Wide-Web context. *Information and Management, 38*(4), 217-230. https://doi.org/10.1016/S0378-7206(00)00061-6

Segars, A. H. & Grover, V. (1993). Re-examining perceived ease of use and usefulness: A confirmatory factor analysis. *MIS Quarterly, 17*(4), 517. https://doi.org/10.2307/249590

So, S. (2016). Mobile instant messaging support for teaching and learning in higher education. *Internet and Higher Education, 31*, 32-42. https://doi.org/10.1016/j.iheduc.2016.06.001

Soria, S., Gutiérrez-Colón, M., & Frumuselu, A. D. (2020). Feedback and mobile instant messaging: Using whatsApp as a feedback tool in EFL. *International Journal of Instruction, 13*(1), 797-812. https://doi.org/10.29333/iji.2020.13151a

Subrahmanyam, A. (2017). Relationship between service quality, satisfaction, motivation and loyalty. *Quality Assurance in Education, 25*(2), 171-188. http://dx.doi.org/10.1108/QAE-04-2013-0016

Tan, H. & Yan, M. (2020). Physician-user interaction and users' perceived service quality: Evidence from Chinese mobile healthcare consultation. *Information Technology and People, 33*(5), 1403-1426. https://doi.org/10.1108/ITP-01-2019-0039

Tarute, A., Nikou, S., & Gatautis, R. (2017). Mobile application driven consumer engagement. *Telematics and Informatics, 34*(4), 145-156. https://doi.org/10.1016/j.tele.2017.01.006

Vazquez, D., Dennis, C., & Zhang, Y. (2017). Understanding the effect of smart retail brand – Consumer communications via mobile instant messaging (MIM) – An empirical study in the Chinese context. *Computers in Human Behavior, 77*, 425-436. https://doi.org/10.1016/j.chb.2017.08.018

Yu, Z. (2020). Extending the learning technology acceptance model of WeChat by adding new psychological constructs. *Journal of Educational Computing Research, 58*(6), 1121-1143. https://doi.org/10.1177/0735633120923772