A Successful Model of Microsoft Teams Online Learning Platform in Vocational High School

Adi Prasetyo, A.G. Tamrin and Yuyun Estriyanto
Universitas Sebelas Maret, Surakarta, Indonesia

An excellent online learning platform requires a success model in its utilization. During the pandemic, a new adjustment (new normal) was needed in the educational field. It was initiated by providing numerous online learning platforms. Therefore, there are only a few successful model evaluations. Thus, this research aims to (1) determine the effect of Microsoft (MS) Teams and (2) develop a successful model as an online learning platform in Vocational High Schools (SMK). This research used a quantitative approach with the PLS-SEM technique in the data analysis. The collection of data was also carried out via the use of a questionnaire, with a total sample of 430 participants (85 teachers and 345 students) using MS Teams at Vocational High Schools. The results showed that four factors were significantly affecting the success of MS Teams, and these includes the information & system qualities, use, and user's satisfaction. However, these findings were based on the factors which were insignificant to the success of the MS Teams. It was also reported that the factors that supported the MS Teams' operation included the Internet and software specifications. Moreover, additional observations also indicated that one of the supporting factors (SF2) was considered invalid.

Keywords: microsoft teams, online learning, PLS-SEM

The 2019 coronavirus (COVID-19) has been reported to have affected the educational field (Abidah, Hidaayatullaah, Simamora, Fehabutar, & Mutakinati, 2020) and learning processes. Since the first case was discovered in Indonesia on March 2, 2020 (Susilo et al., 2020), education has been in the process of adjusting to new habits (New Normal). This new adjustment involves the traditional form of learning (usually carried out in class, face-to-face between educators and students), being replaced with virtual platforms (online), via the use of specific technology to prevent physical contact (Amirullah & Maesaroh, 2020). Therefore, this maintains the safety of both the students and teaching staffs (Czerniewicz, 2020). This new normal has also been discovered to raise various issues in the educational system, such as the students' psychological problems and educators' online learning readiness (Syah, 2020). The pandemic phenomenon has resulted in a search for innovation in the learning process, especially at home (Mahmudah, Putra, & Wardana, 2021).

Correspondence concerning this article should be addressed to Dr. Adi Prasetyo, Universitas Sebelas Maret, Surakarta, Indonesia, E-mail: adiprasetyo792@gmail.com

Most governing bodies worldwide have temporarily closed educational institutions to prevent the spread of the COVID-19 disease (UNESCO, 2021). Presently, the Indonesian government is still implementing distance learning for students and enforcing work from home and office (WFH & WFO) for academic staff. This implemented policy has had a significant impact, especially on teachers unfamiliar with online learning and information technology, making education becoming non-optimal (Mastura & Santaria, 2020). Moreover, with similar experiences globally, educational institutions in Indonesia also utilized online learning (Goldschmidt, 2020). This process is reported to be safe and effective for both teachers and students in the present situation (Long & Khoi, 2020).

Furthermore, it has been discovered that the technology utilization in the learning process has forced institutions to use the "online-only" exclusivity model for educational purposes (Pal & Vanijja, 2020) without any physical interaction (Lestari & Gunawan, 2020; Putra & Irwansyah, 2020). The digital platform is an innovation in online learning media related to technology utilization in the educational field. By utilizing these platforms, online learning at the primary and secondary school levels tends to change the academic image to a better, effective, and enjoyable direction (Lestari & Gunawan, 2020). The familiar digital platforms used in online learning are WhatsApp, Email, Google Classroom, Moodle, Zoom (Gunawan, Suranti, & Fathoroni, 2020), and Microsoft Teams (Abidin, Rumansyah, & Arizona, 2020; Amirullah & Maesaroh, 2020).

Presently, educational institutions in Indonesia (elementary, middle, high/vocational, and higher education levels) do not use the same digital platform in learning processes, therefore impacting success. However, the learning support platform often used in communicating is the WhatsApp application (Gunawan et al., 2020; Lestari & Gunawan, 2020), considering that all average teachers and students/parents have this communicational channel on their respective gadgets (Lestari & Gunawan, 2020). Also, the considerations of each institution are also based on weaknesses, strengths, and suitability of the digital platform. Therefore, a need for innovation and development of the learning media used is required.

Furthermore, the use of more than one digital platform in several learning processes has been discovered to be the problem involved in online education. Therefore, this causes educational actors (educators and students) to become less effective in utilizing technology in the learning process. Due to this problem, this research subject uses a fairly complete online learning platform by combining all features into one application (Pal & Vanijja, 2020). The digital platform used is Microsoft Teams (MS Teams), which is part of the Office 365 application developed by Microsoft company (Microsoft, 2021). This platform became familiar during the pandemic, as many schools in Indonesia use it to support the learning process.

The research results of Buchal and Songsore (2019) showed that majority of students considered MS Teams to be more effective and easy to learn and use. One of the merits of this digital application is that it has an integrated platform for communication, file sharing, and collaborative writing, with one login account. Another advantage is that productivity and communication are increasingly enriched (Pradja & Baist, 2019). Furthermore, Kumar & Nungonda (2019) survey results showed the satisfaction of using the MS Teams application in collaborative learning. This also collaborates with other

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Microsoft products, namely Sway, Form, and One Note (Handayani & Hadi, 2020), all incorporated in Office 365. Another exciting feature of the MS Teams is video conferencing with good image quality (Suprianto, 2018), which allows students and teachers to meet face to face indirectly.

However, an excellent online learning platform requires a success model in its utilization. Besides knowing the weaknesses and strengths of the platform, a success model should also be used as an evaluation material. Many online learning platforms have only performed few evaluation forms for their success during the pandemic, especially in the information system. Based on this theoretical study, background problems, and strengths of the application, this research seeks to develop MS Teams success model as an online learning platform in Vocational High Schools (*SMK*). Thus, the concept of the initial model and the hypothesis of this study are shown in Figure 1. Therefore, the goal of the current study is to (1) determine the effect of Microsoft (MS) Teams and (2) develop a successful model as an online learning platform in Vocational High Schools (SMK).
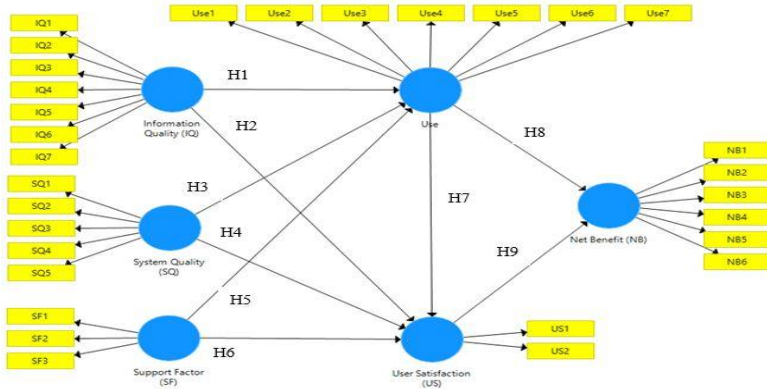

Figure 1 conceptual initial path model (DeLone & McLean, 2003)

Method

Quantitative approach was used in the data processing of this research. However, the research methods used were Structural Equation Modeling (SEM) with the Partial Least Squares (PLS) approach, as they examined the relationship between one or more variables. This method series showed the success factors of MS Teams, which supported the development of a successful model framework for using the digital platform.

The subjects involved were users of the MS Teams platform in Vocational High Schools (*SMK*), namely Teachers and Students.Furthermore, The method of sampling in each school was using simple random sampling technique, such as the users of online learning platforms in Vocational High Schools, was also used. The research sample consisted of 85 teachers and 345 students, which summed up to 430 participants distributed over two locations, namely Magelang and Surakarta Cities, Indonesia. The criteria for selecting the population and city samples are referring to the big cities of Central Java Island in Indonesia.

Table 1
Respondent Data

attribute sample		(%)
total sample		100% (430)
Status	student	80% (345)
	teacher	20% (85)
Region	Surakarta	58% (250)
	Magelang	42% (180)
gender	male	88% (380)
	female	12% (50)
age	<25	82% (351)
	26-35	2% (9)
	36-45	5% (21)
	46-55	9% (37)
	>55	3% (12)

Based on Table 1, the total respondents were 430, consisting of 80% students and 20% teachers. The regional-based sample also consisted of 58% and 42% Vocationals, from Surakarta and Magelang. Moreover, the gender aspect was also dominated by 88% male and 12% female. Regarding most respondents from vocational school students, the age factor was dominated by people under 25 years (82%).

The research instrument used was a questionnaire with statement items, which were obtained from studies of DeLone and McLean (2003), Holsapple & Lee-Post (2006), Lee-Post (2009), Rahmat, Seminar, & Surono (2019), as well as Santoso, Bambang, Legowo (2015) with 30 questionnaire items presented in Table 2. These items were used to measure research determinants, which consisted of independent/exogenous (Information & System Qualities [IQ & SQ] and Supporting Factors [SF]), and dependent/endogenous (Use, User Satisfaction [US], and Net Benefit [NB]) variables. Online questionnaire data collection was also carried out via Microsoft Form, within 1 week.

Table 2
Research Instrument

No.	Variabel Latent	Code	Indicator	References
		IQ1	Comprehensiveness	(DeLone & McLean, 2003)
		IQ2	Written clearly	(Holsapple & Lee-Post, 2006)
	Information	IQ3	Personalization	(DeLone & McLean, 2003)
1	Quality	IQ4	Accuracy	(DeLone & McLean, 2003)
	(Exogen)	IQ5	On time	(DeLone & McLean, 2003)
		IQ6	Relevant	(DeLone & McLean, 2003)
		IQ7	Up-to-date	(Holsapple & Lee-Post, 2006)
2	System Quality	SQ1	Easy to use	(DeLone & McLean, 2003)
	(Exogen)	SQ2	Adaptability	(DeLone & McLean, 2003)

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No.	Variabel Latent	Code	Indicator	References
3	Supporting Factors (Exogen)	SQ3	Stable	(Holsapple & Lee-Post, 2006)
		SQ4	Quickly	(DeLone & McLean, 2003)
		SQ5	Friendly	(Holsapple & Lee-Post, 2006)
		SF1	Specification	Request schools
		SF2	Application	Request schools
		SF3	Internet	Request schools
4	System use (Endogen)	Use1	Assignment	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
		Use2	Attendance	(Microsoft, 2021)
		Use3	Storage	(Microsoft, 2021)
		Use4	Discussion page	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
		Use5	Script	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
		Use6	Audio	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
		Use7	Video	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
5	User satisfaction (Endogen)	US1	Overall satisfaction	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
		US2	Pleasant experience	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
6	net benefits (Endogen)	NB1	Improved learning	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
		NB2	Empowered	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
		NB3	Effective	(Sukmahidayanti, 2015)
		NB4	Academic success	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
		NB5	Efficient	(Sukmahidayanti, 2015)
		NB6	Overall success	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)

Provided the benefits of quantitative study, this research used the Partial Least Squares Path Modeling Method (PLS-SEM) (Boubker, Arroud, & Ouajdouni, 2020; Hair, Risher, Sarstedt, & Ringle, 2019) in analyzing data and testing hypotheses (Janakiraman, Watson, Newby, 2021). Statistical analysis also used the latest version of the SmartPLS 3 application (Al-Maroof & Al-Emran, 2018; Ringle et al., 2015). This conceptual research design adopted the DeLone and McLean information system model (DeLone & McLean, 2003), with slight modifications as needed. The model was selected with the consideration of generally having high suitability and completeness in developing e-learning models within the information systems aspect (Lee-Post, 2009; Rahmat et al., 2019).

This aspect of the research referred to model development via the use of PLS-SEM, which involved a two-step process, such as measurement and structural models, in path designs (Hair et al., 2019; Sarstedt & Cheah, 2019). The measurement analysis model consisted of validity and reliability testing, fits that of the structural was made up of R^2, the path coefficient by looking at the original sample value (O), T-statistic, and

model fit (Hair et al., 2019). Also, the structural model showed the path between constructs, while that of the measurement indicated the relationship between each construct and its indicators (Sarstedt & Cheah, 2019).

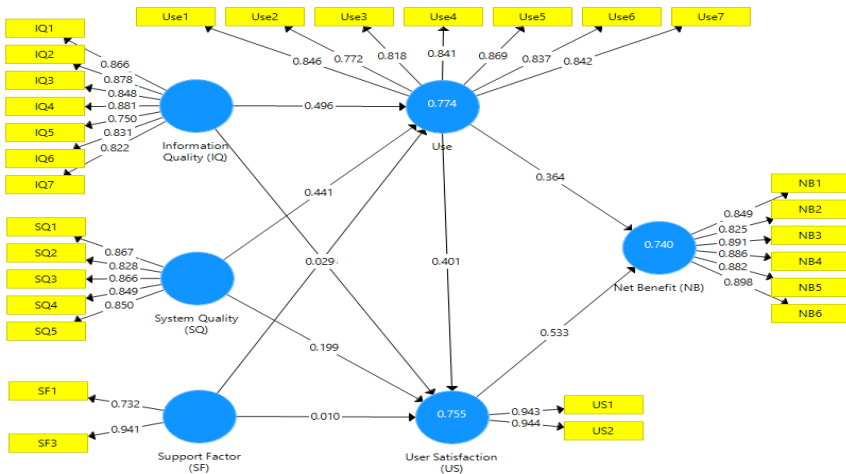## Findings And Discussion

Findings

Figure 2 Result of the path model

Based on the analytical results of the data via the SmartPLS 3.3.3 application, the algorithm outcomes were shown in Figure 2. This was displayed in the form of a path model, accompanied by loading factors, endogenous variables, and the relationship between determinants.

The results of the measurement model analysis

The first stage result of measurement model analysis was the loading factor value (Figure 2), which showed that the decrease from 30 to 29 indicators was due to the fact that SF2 had an LF (loading factor) sum of < 0.7, therefore leading to its elimination. Moreover, SF2 was an indicator of the supporting factor (SF) latent variable. As regards other applications, this indicator was meaningful to support the MS Teams utilization. However, the analytical results of the questionnaire showed that the value was red or < 0.7, which led to an invalid declaration. Therefore, the indicator was unable to measure the supporting factor (SF) variable. However, after the re-analysis of the 29 indicators, all values were observed to be > 0.7 *(see appendix 1)*. Therefore, it was interpreted that all these indicators could measure each variable.

Examination of the average variance extracted (AVE) value was carried out in the second stage to determine the variable validity. The minimum acceptable AVE was 0.50 or higher, which indicated that the construct determinant explained 50% or more of

the item variants, which were compiled in the variable (Hair et al., 2019).

Table 3
Convergent validity

Var	Cronbach Alpha	rho_A	Composite Reliability	AVE
IQ	.930	.932	.944	.706
NB	.937	.937	.950	.761
SF	.827	.829	.846	.711
SQ	.906	.909	.930	.726
US	.876	.876	.942	.890
Use	.926	.928	.941	.694

Based on Table 3, the convergent validity results consisting of all AVE values on the variables were above 0.5. Therefore, it was stated that the existing variables were valid. Furthermore, the reliability test results were measured via *rho_A* due to the fact that according to Hair et al. (2019), Alpha Cronbach and Composite Reliability were the lower and upper limits for internal consistency reliability, respectively. However, *rho_A* was usually between these limits and served as a good representation for the reliability of the internal constructs consistency, assuming the factor model was correct. Moreover, all *rho_A* reliability values showed > 0.7. Therefore, it was stated that all variables had been measured via the use of reliable indicators.

After completing the measurement as regards convergent validity, the test was then based on discriminant validity. This research used the fonnell larcker criteria form, with the diagonal analysis shown in Table 4.

Table 4
Discriminan validity fonell larcker criteria

Var	IQ	NB	SF	SQ	US	Use
IQ	**.840**					
NB	.771	**.872**				
SF	.055	.052	**.843**			
SQ	.752	.708	.030	**.852**		
US	.810	.837	.062	.772	**.943**	
Use	.830	.809	.070	.815	.833	**.836**

Based on Table 4, the diagonal value of the fonnell larcker criteria showed the highest number in each variable. These results then implied that the correlation between these variables was valid.

The results of the structural model analysis

Structural model analysis was carried out because the results of the measurement method were valid and reliable. This analysis stage consisted of R Square, hypothesis testing, and a fit model (Table 5, 6, 8).

Table 5
Result R Square

Var-Endogen	R Square
Use	.774
US	.755
NB	.740

Based on Table 5, exogenous variables affected those that were endogenous. Use variable produced a value of 0.774 (77,4%), which indicated that it was affected by its exogenous variables (SQ, IQ, SF) and other factors, at 77,4% & 22,6%, respectively. Also, US variable produced a value of 0.755 (75,5%), which indicated that it was affected by its exogenous variables (SQ, IQ, SF, Use) and other factors, at 75,5% & 24,5%, respectively. Furthermore, the NB variable produced 0.740 (74%), indicating that it was affected by the Use and US variables, with other factors outside of this research, at 74% & 26%, respectively.

Table 6
Hypotheses Testing

Path	Original Sample (O)	T Statistic (|O/STDEV|)
IQ -> Use	.496	10.399
IQ -> US	.328	5.113
SQ -> Use	.441	8.978
SQ -> US	.199	3.468
SF -> Use	.029	1.144
SF -> US	.010	0.333
Use -> US	.401	5.657
Use -> NB	.364	6.482
US -> NB	.533	10.119

Based on Table 6, the results of the hypothesis measurement were shown by the original sample outcomes and the T-Statistics. Moreover, the interpretation of the guidelines states that when the original sample value is <0 it indicates a positive effect, while if >0 indicates a negative effect. However, the T-statistic was significant when the value was > 1.96 (Wong, 2019).

Table 7
MS Teams Success Factors

No	Factor	Effect	Significance
1	Information Quality	Positive (+)	Significant
2	System Quality	Positive (+)	Significant
3	Supporting factors	Positive (+)	Insignificant
4	Use	Positive (+)	Significant

5	User Satisfaction	Positive (+)	Significant

Based on Table 7, there were five factors with positive effects on MS Teams, namely Information & System Qualities, Supporting Factors, Use, and User Satisfaction. However, not all factors contributed significantly, as the SF (supporting factor) variable had a weak significance contribution to the success of MS Teams.

Table 8
Model Fit

	Saturated Model	**Estimation Model**
SRMR	.056	.056
d_ULS	1.347	1.370
d_G	.832	.834
Chi-Square	1990.816	1994.551
NFI	.830	.830

The results of the model fit testing in this research were reviewed from the values of the standardized root mean squared residual (SRMR), and Normed fit index (NFI). SRMR is defined as the difference between the observed and implied correlation matrix models. However, NFI is defined as a measure of incremental fit, which calculates the Chi-square value of the proposed model, and compares it with a meaningful benchmark (Ramayah et al., 2017). The lower the SRMR, the better the model fit, as a standardized root mean squared residual value of 0.08 or lesser is acceptable (Wong, 2019).

Based on Table 7, the SMSR value was 0.056 < 0.08, with the model interpretation being accepted/good. However, the NFI value was 0.83 or 83%, as these results stated that the path model goodness used in this research process was 83%. Therefore, the design development shown in Figure 1 was observed to be a model fit, as indicated in Figure 3.

Therefore, the results of developing an MS Teams use success model as an online learning platform in Vocational High Schools are shown in Figure 3, which had been declared good with a fit value of 83%.
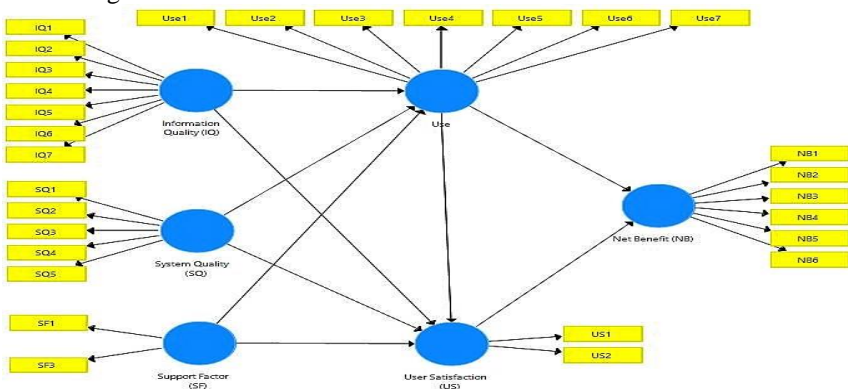
Figure 3 Model Fit

Discussion

Based on the research results, the factor as a concern for improvement was the supporting factors (SF) variable. These supporting factors are tools and materials that support the continued use of MS Teams. These are in the form of Personal Computer (PC), Laptop, or Mobile. Furthermore, an internet connection to access the platform was reviewed from the quota, as signal at the residential home was needed.

Teachers often used laptops/PCs, which were supported by high internet connections in schools to teach, compared to when WFH, where they usually use cellphones with unstable internet data (Cullinan et al., 2021). They also realized that the data on cellphones were smaller than laptops/PCs, as mobile phones were often used in teaching during emergencies. In this case, it was concluded that the teachers felt the impact of these supporting factors, when WFH with unstable connections.

The minority of them do not have laptops/PCs, therefore relying only on cellphones. Even though MS Teams had an application version that was operated on a cellphone, the need for large data storage also required adequate device specifications. In this case, many students often encountered problems in the need for cellphone specifications, which should support the MS Teams operation in learning in accordance with research from Sophonhiranrak (2021).

Another factor that needs improvement is the internet problem. It is an important part of online learning when using the MS Teams platform due to the fact that it requires being connected to the internet to be accessed. The internet demand for teachers and students in Indonesia had been facilitated by quota assistance through a program from the Ministry of Education and Culture, which started in 2020 until planned for 2021 (Ministry of Education and Culture, 2021). The quota assistance eased students and teachers in accessing MS Teams, even though the internet network stability was still a persistent problem in learning. Also, the place factor in accessing the internet impacted the speed and stability of using MS Teams. Limited access of students to devices and the internet was the focus of online learning in developing countries (Baticulon et al., 2020; Mukhtar et al., 2020; Nepal et al., 2020; Sabahat et al., 2020).

Based on the analytical results, the relationship between these supporting factors (SF) affected the use of MS Teams and user satisfaction (US), as the contribution was very small and insignificant to the success of the application (Table 5). Therefore, this variable needs to be improved for its usefulness to be maximized, especially for the future success of MS Teams.

Referring to the results of this research analysis, there are many factors that should be maximized from the utilization of the platform and its users. Because this platform is an online learning platform by combining all features into one application (Pal & Vanijja, 2020). Information and system quality factors (DeLone & McLean, 2003; Holsapple & Lee-Post, 2006) from the use of platforms in this study have a positive and

significant influence. So that the quality needs to be up to date with its users, namely teachers and students. So that the utilization of existing quality can be used optimally by its users. In line with research (Buchal & Songsore, 2019) that the quality of information and systems with ease, speed and stability are some of the indicators in determining the success of MS Teams for learning platforms, especially in vocational schools.

The next success factor is the use of the platform. According to (Mastura & Santaria, 2020) the use of new information technology that makes learning not optimal at the beginning of the pandemic is a challenge for MS Teams users as a learning platform. However, the results show a positive and significant impact that users of this platform can produce interesting learning by utilizing various existing features from discussions, scripts, audio and video conferences with good image or video quality (Suprianto, 2018). The many interesting features of MS Teams make teachers more choices to develop creative learning and have a positive impact on students.

Satisfaction in the use of MS Teams in this study as a whole showed satisfactory results. Users get a pleasant experience (Rahmat et al., 2019) and become a new thing in the implementation of online learning. The results of this satisfaction are assessed from the quality of information and systems, supporting factors and involvement of MS Teams users. With the results so in line with the results of research (Kumar & Nungonda, 2019) which shows that the satisfaction of using the MS Teams application in collaborative learning.

The use of MS Teams has an impact on the quality of user performance including productivity, increasing academic knowledge and overall successful use. The positive and significant impact in supporting vocational learning shows that there has been successful adaptation in the process of adjusting to new habits (New Normal). Learning which is usually done in the classroom, occurs face-to-face between educators and students.

Conclusion

The use of Microsoft Teams as a learning platform for Vocational High Schools showed a positive relationship between endogenous and exogenous variables, which were the information & system qualities (IQ & SQ), supporting factors (SF), use (Use), user satisfaction (US), and Net Benefit (NB). However, there were two relationships with an insignificant effect, namely the supporting factors (SF) on system use (Use) and user satisfaction (US). Therefore, the supporting factor (SF) variable needs to be improved to contribute to the MS Teams' success.

The results on the development of the MS Teams success model was accepted, with a fit value of 83%, as these are expected to become literacy materials for further research. The prospect of further research is to compare the evaluation results in high schools and institutions using MS Teams.

The limitation of this research is that the respondents are still in the context of MS Teams users and have not been distinguished by their status and the scope of the research is only representative of the provincial level.

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Appendix 1. Research Instrument

No.	Variabel Laten	Mnemonik	Indicator	References
1	Information Quality (Eksogen)	IQ1	Comprehensiveness	(DeLone & McLean, 2003)
		IQ2	Written clearly	(Holsapple & Lee-Post, 2006)
		IQ3	Personalization	(DeLone & McLean, 2003)
		IQ4	Accuracy	(DeLone & McLean, 2003)
		IQ5	On time	(DeLone & McLean, 2003)
		IQ6	Relevant	(DeLone & McLean, 2003)
		IQ7	Up-to-date	(Holsapple & Lee-Post, 2006)
2	System Quality (Eksogen)	SQ1	Easy to use	(DeLone & McLean, 2003)
		SQ2	Adaptability	(DeLone & McLean, 2003)
		SQ3	Stable	(Holsapple & Lee-Post, 2006)
		SQ4	Quickly	(DeLone & McLean, 2003)
		SQ5	Friendly	(Holsapple & Lee-Post, 2006)

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No.	Variabel Laten	Mnemonik	Indicator	References
3	Supporting Factors (Eksogen)	SF1	Specification	Permintaan pihak SMK
		SF2	Application	Permintaan pihak SMK
		SF3	Internet	Permintaan pihak SMK
4	System use (Endogen)	Use1	Assignment	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
		Use2	Attendance	(Microsoft, 2021)
		Use3	Storage	(Microsoft, 2021)
		Use4	Discussion page	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
		Use5	Script	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
		Use6	Audio	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
		Use7	Video	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
5	user satisfaction (Endogen)	US1	Overall satisfaction	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
		US2	Pleasant experience	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
6	net benefits (Endogen)	NB1	Improved learning	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
		NB2	Empowered	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
		NB3	Effective	(Sukmahidayanti, 2015)
		NB4	Academic success	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)
		NB5	Efficient	(Sukmahidayanti, 2015)
		NB6	Overall success	(Holsapple & Lee-Post, 2006; Rahmat et al., 2019)