

# Analysis of the Success of Online Learning Implementation Using the Delone and McLean Model

Dhian Nur Rahayu<sup>1</sup>, Anggi Elanda<sup>2</sup>, Lila Setiyani<sup>3\*</sup>

<sup>1,2</sup> Technical Information, STMIK Rosma, Karawang

<sup>3</sup>Information System, STMIK Rosma, Karawang

Author's email: dhian.rahayu@dosen.rosma.ac.id; anggi@rosma.ac.id;  
lila.setiyani@dosen.rosma.ac.id

\*Corresponding author: lila.setiyani@dosen.rosma.ac.id

**Abstract.** *Online learning is a learning that uses the internet, intranets and extranets, or learning that uses a computer network that is directly connected and has a wide (global) scope. This study aims to determine the success of online learning implementation for Vocational High School students in Karawang Regency. The research model used to measure the success of this online learning implementation is the Delone and McLean success model. The data collection technique used in this research is a survey method by distributing questionnaires to the target respondents. Furthermore, the population in this study is Vocational High School students in Karawang Regency, while the sampling technique used is non-probability sampling with purposive sampling type, with the number of respondents obtained from data collection results as many as 194 respondents. The results of this study indicate that the research hypotheses H1, H2, H4, H7 and H8 respectively have a positive effect on the success of online learning implementation, this means that the indicators on the hypothesis have an influence on the successful implementation of online learning in vocational high schools. The results of this study are also expected to provide input to schools that carry out online learning in order to improve and maximize the process of teaching activities.*

**Keywords:** Analysis, Delone and McLean, *Online Learning*

## 1. INTRODUCTION

The development of information technology makes people think about how to make appropriate and fast decisions or be effective and efficient in all activities carried out. The application of information technology systems is expected to be useful to assist activities because information systems supported by information technology can support decision making and can bring success in the activities carried out, such as in the fields of business, economics, social politics and education (O'Brien & Marakas, 2017).

Online learning was first recognized because of the influence of the development of electronic-based learning (e-learning) which was introduced by the University of Illinois through a computer-based learning system. Online learning is a system that can facilitate students to learn more broadly, more, and varied. Through the facilities provided by the system, students can learn anytime and anywhere without being limited by distance, space and time. The learning materials that are studied are more varied, not only in verbal form, but also more varied such as visual, audio, and motion. Online learning is basically distance learning. The distance learning system is a system that has existed since the middle of the 18th century. Since the beginning, distance learning has always used technology for the implementation of learning, starting from the simplest technology to the latest. In brief, the history of the development of distance learning can be grouped according to the dominant technology it uses (Belawati, 2020).

The importance of paying attention to online learning about how to teach, the teaching environment, the weaknesses of online teaching infrastructure, lack of experience and others (Zhang et al., 2020). So this study aims to determine the success of the implementation of online learning in Vocational High Schools (SMK) in Karawang Regency. One model that is often used to measure the success of an information is the DeLone and McLean (D&M) Model (Andriyanto et al., 2021). The Delone McLean Information System Success Model is a model proposed by William H. Delone and Ephraim R. McLean in 1992. This model describes the relationship between variables that influence each other. The variables are system quality, information quality, use, user satisfaction, individual impact and organizational impact. This success model is widely used to measure the implementation of an information system. However, based on several studies, there are still shortcomings so that this model was updated in 2003 with the addition of several variables, namely service quality, intention to use, and changing individual impact and organizational impact into net benefits (Safitri, 2020).

Previous research conducted by (Larasati & Andayani, 2019) which analyzed the Effect of Using a Learning Management System (LMS) on Student Satisfaction Levels Using the DeLone and McLean Method, research conducted by (Efendi, 2020) who evaluated E-Learning Flipped Classroom Using Delone and Mclean Model Information System Success, and research conducted by (Putranti et al., 2019) which analyzed the Quality and Success of Moodle-Based E-Learning Service Implementation by Using the Expectation–Confirmation Model and Delone and Mclean's Model. These studies have successfully measured the level of success of an information system well.

Therefore, to measure the level of success in this study is to use the DeLone and McLean success measurement model. This model was chosen because it is considered capable of explaining the evaluation of the system from the user's point of view, namely user satisfaction. This research was conducted, because previously there had never been an analysis of the level of success in the online learning method, but only measured the success of e-learning implementation. The results of this study are expected to be used as consideration in development and as input to improve or optimize the function of online learning in conducting distance learning.

## **2. LITERATURE REVIEW**

### *2.1 Online Learning*

Online learning is an open learning environment that takes into account aspects of learning and may use internet and web-based technologies to facilitate the learning process and build meaningful knowledge (Horvitz, 2007). According to Carliner (1999) in (Astuti & Novita, 2019) online learning are as follows: online learning as educational material that is presented on a computer. Based on Carliner's definition, online learning is educational material that is broadcast using a computer. Meanwhile, according to (Istiningsih & Hasbullah, 2015) online learning is a learning environment that uses intranet and web-based technology in accessing learning materials and allows learning interactions between fellow students or with teachers anywhere and anytime.

Online learning has several characteristics in general. These characteristics are based on a combination of several theories and approaches that support online learning. In general, it was found that the characteristics of online learning according to Flinders University, namely personal, structured, active and Connective (Riyana, 2020).

Distance learning is primarily characterized by the physical separation between students and teachers. This separation certainly has the potential to affect the types and characteristics of interactions that occur (or should occur) between students and teachers. Moore (1989) in (Belawati, 2020) suggests that there are three types of interactions that occur in a learning process, namely the interaction between: (1) students with learning materials (learner-content), (2) students with teachers (learners-instructors), and (3) students with other students (learners). In online learning, the dynamics of the three types of interactions are strongly influenced by the type of technology and learning media used. (Anderson & Dron, 2017) argues that interactions between fellow students and between students and teachers can be incorporated in the

design of sophisticated learning materials. That is, the design of good distance learning materials can optimize not only interactions between students and the material, but also interactions with teachers and other fellow students. Moreover, in this information age, students have broad access to various learning resources that continue to grow in number so that it is very helpful and enriches the interaction process of students with teaching materials.

## 2.2 The DeLone and McLean Success Model

DeLone and McLean Information System Success Model Is a research model developed to measure the success of an information system based on research conducted by DeLone and McLean (1992). In the DeLone and McLean model or better known as D&M IS Success, the dimensions of success that are measured are all interrelated (Hidayatullah et al., 2020).

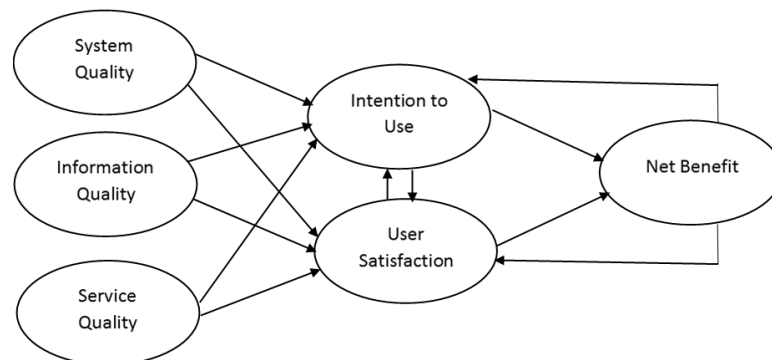


Figure 1. DeLone and McLean (2003) Success Model  
Source: (Hidayatullah et al., 2020)

### *System Quality*

System quality is used to measure the quality of the information technology system itself. System quality has a positive and significant effect on customer satisfaction with information systems (Rukmiyati & Budiarta, 2016). System quality is a combination or combination of hardware and software in an information system. The quality of the system is also a characteristic of information systems that are always attached to the system itself, such as the ease of use of the system, the reliability of a system, and the sophistication of the system and the response time of the system (DeLone & McLean, 2003).

### *Information Quality*

Information quality is the output of the information system used. The quality of information can be in the form of the output of the information such as information that is easy to understand, good accuracy, sufficient completeness, and accuracy (DeLone & McLean, 2003). In the research conducted by DeLone and McLean, information quality focuses on the quality of the output produced by the system (Andoro, Bayu. F and Setiyo, 2020).

### *Service Quality*

Service quality is a must that must be done immediately in order to survive and still get trust, service quality can be interpreted as quality that supports system or application users. Knowing the quality of service (service quality) can be done by comparing the system user's perception of the service received with or obtained with the reality that is actually expected or desired from the existing attributes (Hidayatullah et al., 2020).

### *Intention to Use*

Intention to use refers to how often users use the information system. Measuring usage in information systems can be viewed from various perspectives. In the case of a voluntary system, the actual use of the system would be a suitable measure of success. In cases where the system is mandatory or mandatory, the measurement is carried out subjectively by asking users about perceptions of system use (Trihandayani et al., 2018).

### User Satisfaction

Kotler (2002) defines user satisfaction as a level of feeling of a system user as a result of a comparison between expectations and the results obtained. If the performance of a product or service meets the expectations of the user, the level of user satisfaction can be categorized as high, whereas if the performance of the product or service does not meet the expectations of the user, the level of consumer satisfaction can be said to be low. Then if the results obtained exceed user expectations, of course the user will feel very satisfied (highly satisfied) (Sulaiman, 2006).

### Net Benefits

Net benefits are the impact of the existence and use of information systems on the quality of performance both individually and in organizations. The choice of what impact to measure depends on the system being evaluated and the research objectives (Trihandayani et al., 2018).

## 3. RESEARCH METHODS/METHODOLOGY

This study uses the success model proposed by DeLone and McLean (DeLone & McLean, 2003). With six measures of success factors, namely: Information Quality, Service Quality, System Quality, Intense to Use, Use Satisfaction, Net Benefit (Individual Impact) (Saputro et al., 2015)(Agustina & Sutinah, 2019). The research method used in this study is a quantitative approach, using a survey method through a questionnaire. The researcher used a questionnaire to obtain data related to all the variables of the DeLone and McLean model. According to Sugiyono (2014) a quantitative approach can be interpreted as a research method based on the philosophy of positivism, used to examine certain populations and samples, data collection is quantitative or statistical, with the aim of testing predetermined hypotheses (Purnama & Ariyati, 2018). The population in this study were vocational high school students in Karawang Regency, while the type of sample used was non-probability sampling with a purposive sampling technique. based on the results of data collection, the number of respondents in this study was 194 respondents. Based on the description of the literature above, the research model can be presented as follows:

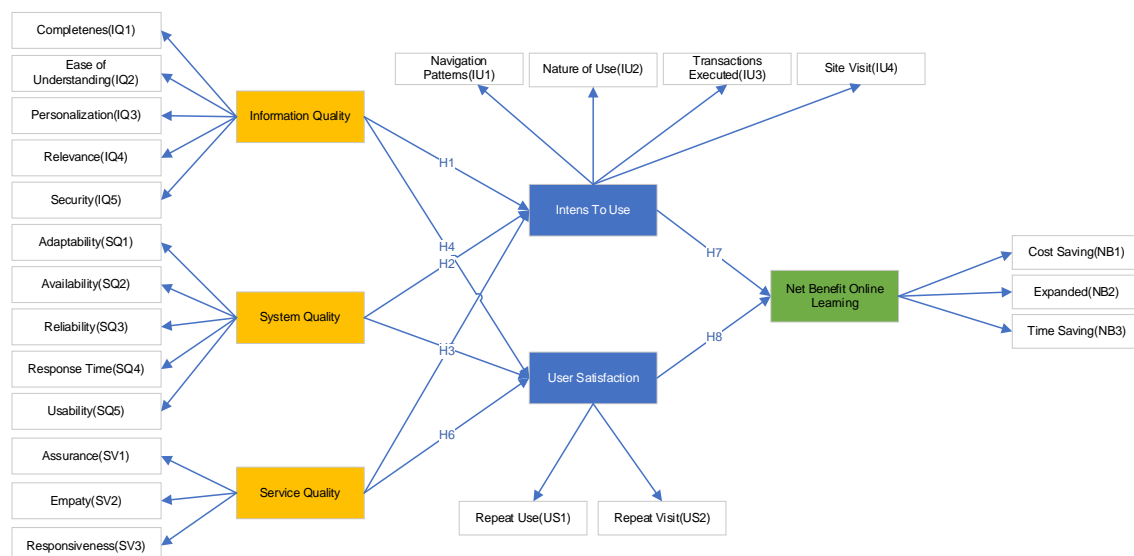


Figure 2. Research Model

Based on the research model in Figure 1, the hypotheses in this study are as follows.

- H1: Information Quality (IQ) is thought to have a positive effect on Intense to Use (IU).
- H2: System Quality (SQ) is suspected to have a positive effect on Intense to Use (IU).
- H3: System Quality (SQ) is suspected to have a positive effect on User Satisfaction (US).
- H4: Information Quality (IQ) is suspected to have a positive effect on User Satisfaction (US).
- H5: Service Quality (SV) is suspected to have a positive effect on Intense to Use (IU).

H6: Service Quality (SV) is suspected to have a positive effect on User Satisfaction (US).

H7: Intense to Use (IU) is suspected to have a positive effect on Net Benefit (NB).

H8: User Satisfaction (US) is suspected to have a positive effect on Net Benefit (NB).

#### 4. RESULTS AND DISCUSSION

##### 4.1 Characteristics of Respondents

An overview of the characteristics of respondents is obtained from the personal data contained in the questionnaire in the respondent's characteristics section which includes the gender, class, age, and school of the respondent. An overview of the characteristics of the respondents can be seen in the following table.

Table 1. General Description of Respondent Characteristics

Characteristics	Number of Respondents	Percentage
<b>Gender</b>		
Men	80	41%
Woman	114	59%
Total	194	100%
<b>Class</b>		
Class X	17	9%
Class XI	97	50%
Class XII	80	41%
Total	194	100%
<b>Age</b>		
15 Years	9	5%
16 Years	84	43%
17 Years	83	43%
18 Years	17	9%
20 Years	1	1%
Total	194	100%
<b>School</b>		
SMKN 1 Karawang	80	41%
SMKN 2 Karawang	13	7%
SMKN 3 Karawang	10	5%
SMKS Rosma Karawang	17	9%
SMKS Teknologi Karawang	47	24%
SMKS Lentera Bangsa Karawang	15	8%
SMKS Wirasaba Karawang	12	6%
Total	194	100%

From Table 1 it can be seen that from 194 respondents, 41% or 80 respondents were male and the remaining 59% or 114 respondents were female. Characteristics of respondents based on class there are 9% or 17 respondents in class X, 50% or 97 respondents in class XI and the remaining 41% or 80 respondents in class XII. Furthermore, the characteristics of respondents according to age are broadly dominated by 84 respondents aged 16 years and 17 years old as many as 83 respondents with a successive percentage of 43%. Lastly, the characteristics of respondents based on school origin are the most dominant from SMKN 1 Karawang with 80 respondents, with a percentage rate of 41%.

##### 4.2 Evaluation of the Measurement Model (Outer Model)

The evaluation evaluation of the measurement model is also called the outer model and is carried out to assess the validity and reliability of the model.

###### 4.2.1 Validity Test

Chin (2013) in (Aini & Nasri, 2018) Convergent validity of the measurement model can be seen from the correlation between indicator scores and variable scores. The indicator is considered valid if it has an AVE value above 0.5 or shows all outer loading

dimensions of the variable having a loading value > 0.7 so it can be concluded that the measurement meets the criteria for convergent validity.

The results of the outer loading test in table 2 show that there are still invalid items. The invalid items are IQ5, IU3, SQ4 and SV3 respectively have a value of <0.7. The condition for proceeding to the next stage is that the outer loading value must be valid, so that the outer loading test will be carried out again by removing/removing the previously invalid indicator. The results of the outer loading and AVE testing can then be seen in the table below.

Table 2. Outer Loading and AVE Value

Variabel	Item	Outer Loading	Average Variance Extracted (AVE)
Information Quality (IQ)	IQ1	0.750	0.633
	IQ2	0.839	
	IQ3	0.805	
	IQ4	0.787	
Intense to Use (IU)	IU1	0.876	0.746
	IU2	0.852	
Net Benefit (NB)	NB1	0.832	0.703
	NB2	0.837	
	NB3	0.847	
System Quality (SQ)	SQ1	0.773	0.593
	SQ2	0.816	
	SQ3	0.727	
	SQ5	0.762	
Service Quality (SV)	SV1	0.860	0.787
	SV2	0.913	
User Satisfaction (US)	US1	0.903	0.814
	US2	0.901	

Based on the results of the analysis that has been done, table 2 above shows that all items for each variable have met the requirements of the convergent validity test, because they have a loading value of 0.7 and the AVE value for each variable has a value above 0.5. Thus, all indicators in the variables in this study can be declared valid.

After testing on the outer loading and AVE, then the indicator also needs to be tested for discriminant validity with correlation values between variables to strengthen the results of the outer loading and AVE that have been done previously.

Table 3. Correlation Values Between Variables

	<b>IQ</b>	<b>IU</b>	<b>NB</b>	<b>SQ</b>	<b>SV</b>	<b>US</b>
<b>IQ</b>	<b>0.796</b>					
<b>IU</b>	0.563	<b>0.864</b>				
<b>NB</b>	0.586	0.612	<b>0.839</b>			
<b>SQ</b>	0.675	0.577	0.514	<b>0.770</b>		
<b>SV</b>	0.554	0.414	0.422	0.634	<b>0.887</b>	
<b>US</b>	0.505	0.692	0.615	0.464	0.354	<b>0.902</b>

From the table above, it can be concluded that the correlation value for each variable with the variable itself has a greater value than the correlation with other variables. Thus, all variables in this study were declared valid and had met the discriminant validity test.

#### 4.2.2 Reliability Test

Reliability tests are used to obtain valid and reliable research results and are used to measure many times to produce the same data (consistency). Reliability test is a tool to measure a questionnaire which is an indicator of a variable or construct. A questionnaire is said to be reliable or reliable if a person's answer to a question is consistent or stable over time (Gozhali, 2016). In this research, if the correlation is 0.7,

it is said that the item provides a sufficient level of reliability, on the contrary, if the correlation value is below 0.7, it is said that the item is less reliable.

Table 4. Composite Reliability Value

Variabel	Composite Reliability
Information Quality (IQ)	0.873
Intense to Use (IU)	0.855
Net Benefit (NB)	0.877
System Quality (SQ)	0.853
Service Quality (SV)	0.881
User Satisfaction (US)	0.897

Table 4 shows that the composite reliability value for all constructs is above the value of 0.7. With the resulting value, all constructs are declared reliable because they are in accordance with the minimum value limit that has been required.

#### 4.3 Evaluation of the Structural Model (Inner Model)

Inner Model or Structural Model describes the relationship between latent variables based on substantive theory. The design of the Structural Model of the relationship between latent variables is based on the formulation of the problem or research hypothesis. Changes in the value of R-Squares can be used to explain the effect of certain exogenous latent variables on endogenous latent variables whether they have a substantive effect. R-square to be used to see the relationship between variables, which is a goodness-fit test model (Anggraeni & Pradhana, 2016).

Table 5. R Square

	R Square	R Square Adjusted
Intense to Use (IU)	0.389	0.379
Net Benefit (NB)	0.445	0.439
User Satisfaction (US)	0.283	0.272

Based on table 5, it can be interpreted that the Intence to Use (IU) construct has an R-square value of 0.389 which means that the constructs of Information Quality (IQ), System Quality (SQ), and Service Quality (SV) are 38.9% and the remaining 61.1% influenced by other constructs not included in this study. Furthermore, the User Satisfaction (US) construct has an R-square value of 0.283 which means that the constructs of Information Quality (IQ), System Quality (SQ), and Service Quality (SV) are 28.3% and the remaining 71.7% is influenced by other constructs that are not included in this research. Finally, the Net Benefit (NB) construct has an R-square value of 0.445 which means the Intence to Use (IU) construct is 44.5% and the remaining 55.5% User Satisfaction (US) is influenced by other constructs not included in this study.

#### 4.4 Discussion (Hypothesis Test)

Hypothesis testing is done by looking at the value of T-statistics using a significance level of 95% ( $\alpha = 0.05$ ). The T-Table value with a significance level of 95% is 1.96. The limit for rejecting and accepting the proposed hypothesis refers to the value of 1.96. Where a hypothesis will be accepted if it has t-statistics greater than 1.96 and if it has t-statistics less than 1.96 then the hypothesis will be rejected (Perdana et al., 2018).

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
<b>IQ -&gt; IU</b>	0.316	0.320	0.101	3.119	0.002
<b>SQ -&gt; IU</b>	0.355	0.353	0.118	2.996	0.003
<b>SQ -&gt; US</b>	0.213	0.209	0.131	<b>1.622</b>	<b>0.106</b>
<b>IQ -&gt; US</b>	0.346	0.353	0.109	3.167	0.002
<b>SV -&gt; IU</b>	0.014	0.019	0.102	<b>0.138</b>	<b>0.891</b>
<b>SV -&gt; US</b>	0.027	0.030	0.090	<b>0.299</b>	<b>0.765</b>

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
<b>IU -&gt; NB</b>	0.358	0.363	0.086	4.151	0.000
<b>US -&gt; NB</b>	0.367	0.367	0.088	4.164	0.000

- a. *H1: Information Quality (IQ) is thought to have a positive effect on Intense to Use (IU)*  
The effect of Information Quality (IQ) on Intense to Use (IU) resulted in t-statistics value of 3,119 with a p value of 0.002. From these results, it can be stated that the t-statistics and p value are **significant**, because it has a t-statistics value > 1.96 with a p-value < 0.05 so that **the first hypothesis (H1) is accepted**. This shows that Information Quality (IQ) has a positive and significant effect on the Intense to Use (IU) in the successful implementation of online learning.
- b. *H2: System Quality (SQ) is suspected to have a positive effect on Intense to Use (IU)*  
The effect of System Quality (SQ) on Intense to Use (IU) produces a t-statistics value of 2,996 with a p value of 0.003. From these results, it can be stated that the t-statistics and p-value are **significant**, because it has a t-statistics value > 1.96 with a p-value < 0.05 so that **the second hypothesis (H2) is accepted**. This shows that System Quality (SQ) has a positive and significant effect on the Intense to Use (IU) in the successful implementation of online learning.
- c. *H3: System Quality (SQ) is suspected to have a positive effect on User Satisfaction (US)*  
The effect of System Quality (SQ) on User Satisfaction (US) produces a t-statistics value of 1.622 with a p value of 0.106. From these results, it can be stated that the t-statistics and p-value are **not significant**, because they have a t-statistics value < 1.96 with a p-value > 0.05 so that **the third hypothesis (H3) is rejected**. This shows that System Quality (SQ) has no positive and insignificant effect on User Satisfaction (US) in the successful implementation of online learning.
- d. *H4: Information Quality (IQ) is suspected to have a positive effect on User Satisfaction (US)*  
The effect of Information Quality (IQ) on User Satisfaction (US) produces a t-statistics value of 3,167 with a p value of 0.002. From these results, it can be stated that the t-statistics and p-value are **significant**, because it has a t-statistics value > 1.96 with a p-value < 0.05 so that **the fourth hypothesis (H4) is accepted**. This shows that Information Quality (IQ) has a positive and significant effect on User Satisfaction (US) in the successful implementation of online learning.
- e. *H5: Service Quality (SV) is suspected to have a positive effect on Intense to Use (IU)*  
The effect of Service Quality (SV) on Intense to Use (IU) produces a t-statistics value of 0.138 with a p value of 0.891. From these results, it can be stated that the t-statistics and p-value are **not significant**, because they have a t-statistics value < 1.96 with a p-value > 0.05 so that **the fifth hypothesis (H5) is rejected**. This shows that Service Quality (SV) has no positive and insignificant effect on Intense to Use (IU) in the successful implementation of online learning.
- f. *H6: Service Quality (SV) is suspected to have a positive effect on User Satisfaction (US)*  
The effect of Service Quality (SV) on User Satisfaction (US) produces a t-statistics value of 0.299 with a p value of 0.765. From these results, it can be stated that the t-statistics and p-value are **not significant**, because they have a t-statistics value < 1.96 with a p-value > 0.05 so that **the sixth hypothesis (H6) is rejected**. This shows that Service Quality (SV) has no positive and insignificant effect on User Satisfaction (US) in the successful implementation of online learning.
- g. *H7: Intense to Use (IU) is suspected to have a positive effect on Net Benefit (NB)*  
The effect of Intense to Use (IU) on Net Benefit (NB) produces a t-statistics value of 4.151 with a p value of 0.000. From these results, it can be stated that the t-statistics and p value are **significant**, because it has a t-statistics value > 1.96 with a p-value < 0.05 so that **the seventh hypothesis (H7) is accepted**. This shows



that Intense to Use (IU) has a positive and significant effect on Net Benefit (NB) in the successful implementation of online learning.

- h. *H8: User Satisfaction (US) is suspected to have a positive effect on Net Benefit (NB)*

The effect of User Satisfaction (US) on Net Benefit (NB) produces a t-statistics value of 4.164 with a p value of 0.000. From these results, it can be stated that the t-statistics and p value are **significant**, because it has a t-statistics value > 1.96 with a p-value <0.05 so that **the eighth hypothesis (H8) is accepted**. This shows that User Satisfaction (US) has a positive and significant effect on Net Benefit (NB) in the successful implementation of online learning.

## CONCLUSION

From the results of the analysis that has been done, it can be concluded that the implementation of online learning in vocational high schools shows the overall success rate is quite good, but there are still gaps in it so that the implementation of online learning still requires improvement to produce better service quality for its users. These results are based on the results of hypothesis testing that have been carried out, there are several variables that have a positive influence on the success of online learning implementation, namely the information quality and system quality variables have a positive effect on intense to use, information quality has a positive effect on user satisfaction, intense to use and user satisfaction. positive effect on net benefits.

## REFERENCES

- Agustina, N., & Sutinah, E. (2019). Model Delone dan McLean Untuk Menguji Kesuksesan Aplikasi Mobile Penerimaan Mahasiswa Baru. *InfoTekJar (Jurnal Nasional Informatika Dan Teknologi Jaringan)*, 3(2), 76–82. <https://doi.org/10.30743/infotekjar.v3i2.1008>
- Anderson, T., & Dron, J. (2017). Three Generations of Distance Education Pedagogy. *International Review of Research in Open and Distributed Learning*, 18(1), 1–18.
- Andoro, Bayu. F and Setiyo, L. A. (2020). Analisa Kesuksesan Aplikasi Madang Berbasis Android Dengan Menggunakan Pendekatan Delone Dan Mclean. *Seminar Nasional Teknologi Informasi Dan Komunikasi 2020*, 589–596.
- Andriyanto, D., Said, F., Titiani, F., & Erni, E. (2021). Analisis Kesuksesan Aplikasi Jakarta Kini (JAKI) Menggunakan Model Delone and McLean. *Paradigma - Jurnal Komputer Dan Informatika*, 23(1), 43–48. <https://doi.org/10.31294/p.v23i1.10018>
- Anggraeni, M., & Pradhana, M. S. (2016). KEPUASAN KERJA, KOMITMEN ORGANISASI DAN TURNOVER INTENTIONDI PT. HILLCONJAYA SAKTI, CAKUNG, JAKARTA TIMUR. *DIPONEGORO JOURNAL OF MANAGEMENT*, 5(4), 1–29.
- Astuti, D. A. &, & Novita, D. (2019). Blended learning terhadap kemampuan komunikasi matematis. *Prosiding Sendika*, 5(1), 191–199.
- Belawati, T. (2020). *Pembelajaran Online* (2nd ed.). Universitas Terbuka.
- DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems*, 19(4), 9–30. <https://doi.org/10.1080/07421222.2003.11045748>
- Efendi, R. (2020). Evaluasi E-Learning Flipped Classroom Menggunakan Delone Dan Mclean Model Information System Success. *JOISIE Journal Of Information System And Informatics Engineering*, 4(2), 112–120.
- Gozhali, I. (2016). *Aplikasi Analisis Multivariete Dengan Program IBM SPSS 23* (8th ed.). Badan Penerbit Universitas Diponegoro.
- Hidayatullah, S., Khourouh, U., Windhyastiti, I., Patalo, R. G., & Waris, A. (2020). Implementasi Model Kesuksesan Sistem Informasi DeLone And McLean Terhadap Sistem Pembelajaran Berbasis Aplikasi Zoom Di Saat Pandemi Covid-19. *Jurnal Teknologi Dan Manajemen Informatika*, 6(1), 44–52. <https://doi.org/10.26905/jtmi.v6i1.4165>
- Horvitz, B. S. (2007). N. Dabbagh and B. Bannan-Ritland, Online Learning: Concepts, Strategies,

- Istiningsih, S., & Hasbullah, H. (2015). Blended Learning, Trend Strategi Pembelajaran Masa Depan. *Jurnal Elemen*, 1(1), 49. <https://doi.org/10.29408/jel.v1i1.79>
- Larasati, N. A., & Andayani, S. (2019). Pengaruh Penggunaan Learning Management System (LMS) Terhadap Tingkat Kepuasan Mahasiswa Menggunakan Metode DeLone and McLean. *Jurnal Teknik Informatika UNIKA Santo Thomas*, 4(1), 13–20.
- O'Brien, J. A., & Marakas, G. M. (2017). *Management Information Systems, Tenth Edition* (Tenth Edit). McGraw-Hill Irwin.
- Perdana, M. W., Herdiansyah, M. I., & Mirza, A. H. (2018). Analisis Faktor-Faktor Keberhasilan Dan Implementasi Guru Pembelajar Online (Gpo) Pada Guru Smkn Di Kota Palembang Menggunakan Kerangka Kerja Hot-Fit Berbasis Smartpls. *Jurnal Digital Teknologi Informasi*, 1(1), 27–36. <https://doi.org/10.32502/digital.v1i1.932>
- Purnama, R. A., & Ariyati, P. P. (2018). PENGARUH KREATIVITAS IKLAN TERHADAP KEPUTUSAN PEMBELIAN PADA MATAHARI DEPARTEMEN STORE KOTA SUKABUMI. *Jurnal Ekonomedia*, 7(01), 1–8.
- Putranti, A. D. A. D., Herlambang, A. D., & Saputra, M. C. (2019). Kualitas dan Kesuksesan Implementasi Layanan E-Learning Berbasis Moodle dengan Menggunakan Expectation – Confirmation Model dan Delone and Mclean's Model. *Jurnal Pengembangan Teknologi Informasi Dan Ilmu Komputer E-ISSN:2548-964X*, 3(1), 90–99.
- Riyana, C. (2020). *Konsep Pembelajaran Online*. Perpustakaan Digital Universitas Terbuka. <https://www.pustaka.ut.ac.id/lib/wp-content/uploads/pdfmk/TPEN4401-M1.pdf>
- Rukmiyati, N. M. S., & Budiarta, I. K. (2016). Pengaruh Kualitas Sistem, Kualitas Informasi Dan Perceived Usefulness Terhadap Kepuasan Pengguna Sistem Informasi Akuntansi. *E-Jurnal Ekonomi Dan Bisnis Universitas Udayana*, 5(1), 115–142. <https://doi.org/10.31154/kar.v1i2.475.1-11>
- Safitri, N. (2020). Model Kesuksesan Sistem Teknologi Informasi Delone & McLean pada Sistem Informasi Pengelolaan Proyek. *Jurnal of Informatics*, 4(2), 173–182.
- Saputro, P. H., Budiyanto, D., & Santoso, J. (2015). Model Delone and Mclean untuk Mengukur Kesuksesan E-Government Kota Pekalongan. *Scientific Journal of Informatics*, 2(1), 1–8. <https://doi.org/10.15294/sji.v2i1.4523>
- Sulaiman, A. (2006). ANALISIS TINGKAT KEPUASAN PENGGUNA LANGSUNG DAN TIDAK LANGSUNG TERHADAP APLIKASI SUATU SISTEM INFORMASI. *Business & Management Journal Bunda Mulia*, 2(2), 31–36.
- Trihandayani, L. H., Aknuranda, I., & Mursityo, Y. T. (2018). Penerapan Model Kesuksesan Delone dan Mclean pada Website Fakultas Ilmu Komputer ( FILKOM ) Universitas Brawijaya. *Jurnal Pengembangan Teknologi Informasi Dan Ilmu Komputer (J-PTIIK) Universitas Brawijaya*, 2(12), 7074–7082.
- Zhang, W., Wang, Y., Yang, L., & Wang, C. (2020). Suspending Classes Without Stopping Learning: China's Education Emergency Management Policy in the COVID-19 Outbreak. *Journal of Risk and Financial Management*, 13(3), 55. <https://doi.org/10.3390/jrfm13030055>