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# Implementation of DeLone and McLean Models To Measure The Success of Online-Based Tutoring System

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**ABSTRACT**

Online learning system or better known as tutoring "bimbel" online is one of the learning methods that are delivered electronically using a computer device or smartphone and connected to the internet. Online tutoring is designed to enable distance learning through the internet without having to come face-to-face with the teacher. Rumah Belajar is a learning portal prepared by the Ministry of Education and Culture containing more than 12,934 learning materials. This portal can be utilized by students as an alternative to getting learning materials, be it inside or outside school hours. This research uses DeLone and McLean success model which only uses variable information quality, system quality, service quality, and user satisfaction. From the results of questionnaire collection, as many as 100 respondents provided th e data information needed in this study. The data is processed with Structural Equation Modeling (SEM) application using AMOS22 application. It is expected that with this research can be obtained recommendations about the learning system or online learning guidance that is good and liked by many users.

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## 1. INTRODUCTION

Information and communication technology (ICT) has become commonplace for people in the world. All information can be accessed easily as if it were just at your fingertips [1]. The development of gadget technology such as smartphones and laptops make it easier for people to use the internet to get all their needs online [2]. This development is also followed by the use of learning media both physically and non-physically. Learning media is defined as everything that can be used to channel messages, stimulate the thoughts, feelings, attention, and willingness of students so that they can encourage the learning process [3].

Guidance in learning in particular can be done in various aspects, both from tutoring in terms of writing, memorizing, motivating students, and tutoring in terms of reading. Tutoring is carried out to assist students in developing themselves, attitudes, and study habits that are right for themselves

to master knowledge and skills and preparation to continue their education to a higher level [4][5]. Although tutoring there are many things, but basically learning guidance still always has the same important role in the aspects of student learning both formally and informally so that it will be able to encourage children in achieving optimal learning achievements. In this case, learning achievement is a learning outcome that can be achieved by students during evaluation. According to W.S. Winkel achievement is a proof of learning outcomes that students can achieve after the learning process [6][7].

Online tutoring is designed to enable distance learning through the internet without having to come face-to-face with the teacher. Online tutoring can provide alternative options for students who have internet access to effective, efficient, and interactive learning assistance services optimally [8][9]. The generation that often utilizes ICT, most of whom are junior high and high school students spend more time with their gadgets so it can be said that they are dependent on technology. For them, the technology in the hand can be likened to air and water. They won't be able to live well if they're not accompanied by technology. They feel that technology makes them easily connected to each other and easy to access important information every day. This ultimately affects their learning motivation in school. Meanwhile, the teaching and learning process (PBM) in schools still uses a conventional model better known as teacher centered learning (TCL) so that the model feels boring for today's students. As a result, many students today find it difficult to understand the lessons learned at school and then get home they are again busy with their gadgets and forget about the topics that have been learned in school. Therefore, most parents are aware of this so as to provide additional lessons for their children to accommodate as well as expect assurance that their children get good learning outcomes in school. Parents enroll their children in well-known tutoring institutions (bimbel) or seek private tutors from liaison agencies and spend a lot of money in the hope that bimbel or private tutoring can boost the motivation and learning outcomes of their children.

Guidance services that enable students to obtain various materials from certain resource persons (especially from advisers / counselors) that are useful to support their daily lives both as individuals and as students, family members and the community and for consideration in decision making [6].

From the above problems, to improve the quality of users of Online-based Tutoring applications, especially Home Learning Applications applied DeLone & McLean 2003 success model by using system quality variables, information quality, service quality to measure user satisfaction in such use. To model and measure the extent of success and what factors influence its success and failure in order to be evaluated. Research related to this research is based on journals and previous studies that have been conducted, including.

Research [10] entitled: “Associations of private tutoring with Chinese students’ academic achievement, emotional well-being, and parent-child relationship”: stated that there was a significant relationship between private tutoring and student test scores, especially for English and mathematics. Many students nowadays find it difficult to understand the lessons learned at school so that they get home again busy with their gadgets and forget about the topics that have been learned in school. Therefore, most parents are aware of this so as to provide additional lessons for their children by enrolling their children to well-known tutoring institutions or looking for private tutors. With the development of m-learning, students no longer need to come to bimbel locations because they can learn whenever they want everytime they bring a laptop or smartphone by accessing online tutoring (bimbel online).

Research [11] entitled: “Analysis of User Satisfaction with Online Education Platforms in China during the COVID-19 Pandemic”, that users’ personal factors have no direct influence on user satisfaction, while platform availability has the greatest influence on user satisfaction. Online education is an implication of the integration of technology and education, as an alternative learning media based on internet technology. The importance of evaluating the online education system to ensure learning goes well, effective use, and positive impact on students [12].

This study used the DeLone and McLean success model (2003) to measure the success rate of the system's implementation [13][14]. DeLone and McLean's success model (2003) has six variables

as a measurement: System quality, Information quality, Service quality, Usage, User satisfaction and Net benefit. The six variables were all used in this study. In this study obtained 6 hypotheses used for the analysis process. The results of the 6 hypotheses were accepted. From the results of the analysis conducted stated that the implementation of this system can be said to be successful for the title submission process, but in the guidance, process is still not successful. This is because there are still some menu errors and not all lecturers use the system.

## 2. RESEARCH METHOD

a. Explaining Data Collection Methods

The methods of data collection conducted in this study are:

1. Questionnaire/Questionnaire

   Questionnaire is a data collection technique that is done by giving a set of questions or written statements to respondents to answer. Kusioner in this study disseminated as many as 100 polls given to students of SMP Negeri 9 Pontianak and SMP Negeri 17 Pontianak Jaya who use *online-based* tutoringapplications. The type of questionnaire in this study used a *Likert* scale created in the form of a check *list* in an answer field.

2. Observation

   Observation is a data collection technique has a specific characteristic when compared to other techniques, namely interviews and questionnaires. Observations in this study, namely at SMP Negeri 9 Pontianak and SMP Negeri 17 Pontianak.

b. Data Analysis Methods

The method to process the data in this study uses Structural Equation Modeling (SEM) as a statistical analysis tool which is a combination of factor analysis and regression[15], [16][16][17]. This research is also for know the relationship between independent variables and dependent variables and know the estimated maximum likehood in SEM[18].

## 3. RESULTS AND DISCUSSION

### 3.1 Respondents Profile

Respondents in this study were students of SMP Negeri 9 Pontianak and SMP Negeri 17 Pontianak. Questionnaires distributed as many as 100 were distributed directly and online to respondents. The number of samples has met the rules of SEM analysis by requiring samples ranging from 100-400 samples. The profile data of respondents who are the object of research can be seen in table 1. Following:

Table 1. Respondent Classification

| Respondent Classification | | Amount | Percentage |
|---|---|---|---|
| Gender | Male | 28 | 28% |
| | Women | 72 | 72% |
| Amount | | 100 | 100 |
| School Origin | SMKN 2 Pontianak | 43 | 43% |
| | SMKN 1 Rasau Jaya | 57 | 57% |
| Amount | | 100 | 100 |

Based on Table.1 above, shows that male students as much as 28%, while female gender as much as 72%, and School Origin shows that students from SMP Negeri 9 Pontianak 43%, while students / i SMP Negeri 17 Pontianak 57%.

### 3.2 Theoretical Model Building Constructions

Explanatory theories can be expressed in terms of a set of linked propositions, at least one of which expresses a general principle[19][20]. The constructs (factors) and dimensions to be examined from the theoretical model above will be described in the following chart:

Table 2. Theoretical Model Building

| Variable | Indicators | Amount |
|---|---|---|
| Quality Information (KI) (DeLone &McLean, 2003) | X1= Punctuality | 1 |
| | X2= Brevity | 1 |
| | X3= Easy to understand | 1 |
| | X4= Actuality | 1 |
| | X5= Relevance | 1 |
| System Quality (KS) (DeLone & McLean, 2003) | X6= System availability | 1 |
| | X7= Response Speed | 1 |
| | X8= Flexibility system | 1 |
| | X9= Ease of Use | 1 |
| | X10= Integrated Completeness | 1 |
| | X11= System Reliability | 1 |
| | X12= System Consistency | 1 |
| Quality of Service (KP) | X13= Responsiveness | 1 |
| | X14= Guarantee | 1 |
| | X15= Empathy | 1 |
| User Satisfaction (KPG) (DeLone & McLean, 2003) | Y1= System user satisfaction rating | 1 |
| | Y2= Difficulty using the system | 1 |
| | Y3= Convenience of system usage | 1 |
| | Y4= System usage satisfaction requirements | 1 |
| | Y5= Pleasure in the satisfaction of using the system | 1 |

### 3.3 Discussion

**Model Based Testing Theory**

At this stage will be presented a description of inferential statistical analysis, starting from the initial model description, assumption test, conformity test, significant test, and final model description[21]. In accordance with the proposed model, this study includes independent/exogenous variables i.e., quality of information (KI), system quality (KS), service quality (KP) and dependent/endogenous variables i.e., user satisfaction (KPG) [22][23].

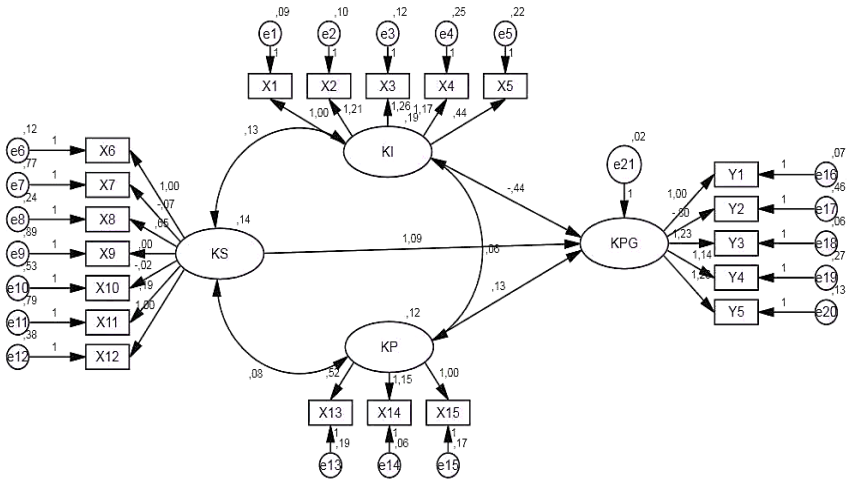


Fig 1. Early Model Research

From the initial research model that has been studied produce a hypothetical analysis that will be described in Table 3 below:

Table 3. Preliminary Model Conformity Test Results

| Conformity Size | Critical Value Limits | Model Test Results |
|---|---|---|
| ***a. Absolute Fit Measure*** | | |
| Chi-Square $X^2$ (CMIN) | Small, $\leq$ 2 α; df | 309,029 |
| Probability | 0.05 | 0,000 |
| Chi-Square $X^2$ Relative (CMIN/DF) | $\leq$ 2.0 | 1,884 |
| 4. GFI | $\geq$ 0.90 | 0,765 |
| 5. RMSEA | $\leq$ 0.08 | 0,095 |
| ***b. Incremental Fit Measure*** | | |
| 1. AGFI | $\geq$ 0.90 | 0,699 |
| 2. TLI | $\geq$ 0.95 | 0,769 |
| 3. NFI | $\geq$ 0.90 | 0,664 |
| 4. CFI | $\geq$ 0.95 | 0,810 |
| ***c. Parsimonious Fit Measures*** | | |
| 1. PNFI | $\geq$ 0.60 | 0,573 |
| 2. PGFI | $\geq$ 0.60 | 0,597 |

**Validity testing**

Validity testing is used to test the ability (accuracy) of an indicator so that it can represent a latent variable. To measure validity construct can be seen from the value of loading factor. In this study, model analysis was conducted Confirmatory Factor Analysis (CFA) against exogenous and endogenous latent variables [24][25].

Based on the results of the CFA test can be submitted validity test as follows:

Table 4. Validity Test Results

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| **KPG** | <--- | KS | 1,094 | ,652 | 1,678 | ,093 | **par_20** |
| **KPG** | <--- | KP | ,132 | ,298 | ,443 | ,658 | **par_21** |
| **KPG** | <--- | KI | -,443 | ,355 | -1,248 | ,212 | **par_22** |
| **X1** | <--- | KI | 1,000 | | | | |
| **X2** | <--- | KI | 1,211 | ,122 | 9,914 | *** | **par_1** |
| **X3** | <--- | KI | 1,256 | ,132 | 9,552 | *** | **par_2** |
| **X4** | <--- | KI | 1,169 | ,159 | 7,357 | *** | **par_3** |
| **X5** | <--- | KI | ,442 | ,120 | 3,683 | *** | **par_4** |
| **X12** | <--- | KS | 1,000 | | | | |
| **X11** | <--- | KS | -,188 | ,263 | -,717 | ,473 | **par_5** |
| **X10** | <--- | KS | -,022 | ,215 | -,102 | ,919 | **par_6** |
| **X9** | <--- | KS | -,003 | ,279 | -,009 | ,993 | **par_7** |
| **X8** | <--- | KS | ,651 | ,183 | 3,561 | *** | **par_8** |
| **X7** | <--- | KS | -,065 | ,268 | -,243 | ,808 | **par_9** |
| **X6** | <--- | KS | 1,000 | ,216 | 4,623 | *** | **par_10** |
| **X15** | <--- | KP | 1,000 | | | | |
| **X14** | <--- | KP | 1,154 | ,210 | 5,505 | *** | **par_11** |
| **X13** | <--- | KP | ,519 | ,171 | 3,040 | ,002 | **par_12** |
| **Y1** | <--- | KPG | 1,000 | | | | |
| **Y2** | <--- | KPG | -,803 | ,221 | -3,643 | *** | **par_13** |
| **Y3** | <--- | KPG | 1,226 | ,141 | 8,699 | *** | **par_14** |
| **Y4** | <--- | KPG | 1,144 | ,197 | 5,796 | *** | **par_15** |
| **Y5** | **<---** | **KPG** | **1,255** | **,163** | **7,683** | *** | **par_16** |

**Information Quality (KI)**

Table 5. Validity Test Results

| Indicators | Estimation | Description |
|---|---|---|
| X1 (Punctuality) | 1,000 | Valid constructs |
| X2 (Brevity) | 1,211 | Valid constructs |
| X3 (Easy to Understand) | 1,256 | Valid constructs |
| X4 (Actuality) | 1,169 | Valid constructs |
| X5 (Relevance) | 0,442 | Invalid construct |

From the output of *standardized loading*estimate, seen *estimate* on *standardized regression weight* which is the value of loading *factor* indicator variable quality information for X1, X2, X3, X4 has a value above 0.50 means a valid construct. While the X5 indicator < 0.50 is an invalid construct and must be excluded from latent variables of information quality.

**System Quality (KS)**

Table 6. KS Variable Validity Test

| **Indicators** | **Estimation** | **Description** |
|---|---|---|
| X6 (System Availability) | 1,000 | Valid constructs |
| X7 (Response Speed) | -0,065 | Invalid construct |
| X8 (System Flexibility) | 0,651 | Valid constructs |
| X9 (Ease of Use) | -0,003 | Invalid construct |
| X10 (Integrated completeness) | -0,022 | Invalid construct |
| X11 (System Reliability) | -0,188 | Invalid construct |
| X12 (Consistency of Response) | 1,000 | Valid constructs |

From the output of *standardized loading*estimate, seen *estimate* on *standardized regression weight* which is the value of loading *factor* indicator variable quality system for indicator X6, X8, X12 has a value above 0.50 means a valid construct. While the indicators X7, X9, X10, X11 <0,50 is invalid construct and must be excluded from the system quality latent variable.

**Service Quality (KP)**

Table 7. KP Variable Validity Test

| **Indicators** | **Estimation** | **Description** |
|---|---|---|
| X13 (Responsiveness) | 0,519 | Valid constructs |
| X14 (Warranty) | 1,154 | Valid constructs |
| X15 (Empathy) | 1,000 | Valid constructs |

From the output of *standardized loading*estimate, seen *estimate* on *standardized regression weight* which is the value of loading *factor* variable indicator quality of service for X13, X14, X15 has a value above 0.50 means a valid construct. Where as there are no invalid indicators and should be excluded from latent variables of service quality.

**User Satisfaction (KPG)**

Table 8. KPG Variable Validity Test

| **Indicators** | **Estimation** | **Description** |
|---|---|---|
| Y1 (Satisfaction rating) | 1,000 | Valid constructs |
| Y2 (Difficulty) | -0,803 | Invalid construct |

| | | |
|---|---|---|
| Y3 (Convenience) | 1,226 | Valid constructs |
| Y4 (Terms) | 1,144 | Valid constructs |
| Y5 (Fun) | 1,255 | Valid constructs |

From the results of standardized loading estimate output, visible loading factor value (estimate on standardized regression weight) latent variable indicator customer satisfaction for Y1, Y3, Y4, Y5 has a value above 0.50 means a valid construct, and for Y2 has a value < 0.50 means an invalid construct and must be excluded from latent variables user satisfaction.

In reliability testing the recommended approach is to look for the value of composite magnitude (construct) reliability and variance extracted from each latent variable by using the information contained in the loading factor and measurement error. Cut-off value of construct reliability is at least 0.70, while Cut-off value from variance extracted minimum of 0.50.

Here are the results of each variable reliability test:

a. KI Variable Reliability Test
   Construct-reliability

$$\Sigma\ Std\ Loading = 1{,}000 + 1{,}211 + 1{,}256 + 1.169 = 4{,}636$$
$$\Sigma \in j = 1 + 1{,}466 + 1{,}588 + 1{,}366 = 5{,}42$$

$$Construct - reliability = \frac{(4{,}636)^2}{(4{,}636)^2 + 5{,}42} = 0{,}79$$

   Variance-extracted

$$\Sigma Std\ Loading^2 = 1{,}000^2 = 1$$
$$Variance - extracted = \frac{5{,}42}{5{,}42 + 5{,}42} = 0{,}5$$

b. KS Variable Reliability Test
   Construct-reliability

$$\Sigma\ Std\ Loading = 1{,}000 + 0{,}651 + 1{,}000 = 2{,}651$$
$$\Sigma \in j = 1 + 0{,}423 + 1 = 2{,}423$$

$$Construct - reliability = \frac{(2{,}651)^2}{(2{,}651)^2 + 2{,}423} = 0{,}74$$

   Variance-extracted

$$\Sigma Std\ Loading^2 = 1{,}000^2 = 1$$
$$Variance - extracted = \frac{2{,}423}{2{,}423 + 2{,}423} = 0{,}5$$

c. Reliability testing variable KP
   Construct-reliability

$$\Sigma\ Std\ Loading = 0{,}519 + 1{,}154 + 1{,}000 = 2{,}673$$
$$\Sigma \in j = 0{,}269 + 1{,}331 + 1 = 2{,}6$$

$$Construct - reliability = \frac{(2{,}673)^2}{(2{,}673)^2 + 2{,}6} = 0{,}73$$

   Variance-extracted

$$\Sigma Std\ Loading^2 = 1{,}000^2 = 1$$
$$Variance - extracted = \frac{2{,}6}{2{,}6 + 2{,}6} = 0{,}5$$

d. Reliability testing variable KPG

Construct-reliability

$$\Sigma\ Std\ Loading = 1{,}000 + 1{,}226 + 1{,}144 + 1{,}255 = 4{,}625$$
$$\Sigma \in j = 1 + 1{,}501 + 1{,}308 + 1{,}575 = 5{,}386$$

$$Construct - reliability = \frac{(4{,}625)^2}{(4{,}625)^2 + 5{,}386} = 0{,}79$$

Variance-extracted

$$\Sigma Std\ Loading^2 = 1{,}000^2 = 1$$
$$Variance - extracted = \frac{5{,}386}{5{,}386 + 5{,}386} = 0{,}5$$

Table 9. Combined Reliability Test

| Latent Variables | Construct Reliability | Variance Extracted |
|---|---|---|
| Information Quality (KI) | 0,79 | 0,5 |
| System Quality (KS) | 0,74 | 0,5 |
| Quality of Service (KP) | 0,73 | 0,5 |
| User Satisfaction (KPG) | 0,79 | 0,5 |

From the table above it can be conveyed that the latent variable constructs all qualify *the cut-off value* because *construct reliability* of all latent variables < 0.70. Thus, it can be said that each variable has good reliability. Of all the variables there is an *extranced variance* value indicating that the indicators have well represented the latent construct because of its value $\geq$ 0.50.

**Assumption Test**

To find out if the data used has met sem assumptions, it is necessary to test the model assumptions. The assumptions that should be considered in this test are:

1. Sampel Size

   The number of sample data in this study was 100 samples. This number has met the sample size requirements in SEM modeling, which is a minimum of 100-400 samples. The number of samples in this study is described in appendix 1.

2. Normality Test

From the research results, the normality test results are obtained which can be seen as follows:

Table 10. Assessment of Normality

| Variable | min | max | skew | c.r. | kurtosis | c.r. |
|---|---|---|---|---|---|---|
| Y5 | 3,000 | 5,000 | -,005 | -,022 | -,340 | -,695 |
| Y4 | 2,000 | 5,000 | -,010 | -,042 | -,255 | -,521 |
| Y3 | 3,000 | 5,000 | ,272 | 1,110 | 1,047 | 2,138 |
| Y2 | 1,000 | 3,000 | ,365 | 1,490 | -1,062 | -2,167 |
| Y1 | 3,000 | 5,000 | ,644 | 2,627 | 1,617 | 3,302 |
| X13 | 2,000 | 5,000 | 1,103 | 4,503 | 1,484 | 3,029 |

| | | | | | | |
|---|---|---|---|---|---|---|
| X14 | 3,000 | 5,000 | ,432 | 1,763 | ,884 | 1,805 |
| X15 | 3,000 | 5,000 | -,306 | -1,247 | -1,116 | -2,278 |
| X6 | 3,000 | 5,000 | ,300 | 1,226 | ,172 | ,352 |
| X7 | 1,000 | 5,000 | -,329 | -1,343 | ,327 | ,667 |
| X8 | 2,000 | 5,000 | ,475 | 1,938 | ,792 | 1,617 |
| X9 | 1,000 | 5,000 | -,630 | -2,571 | ,365 | ,744 |
| X10 | 1,000 | 5,000 | -,190 | -,777 | ,580 | 1,183 |
| X11 | 1,000 | 5,000 | ,120 | ,489 | ,007 | ,014 |
| X12 | 2,000 | 5,000 | ,350 | 1,430 | -,151 | -,308 |
| X5 | 2,000 | 5,000 | ,700 | 2,857 | 1,960 | 4,000 |
| X4 | 2,000 | 5,000 | -,456 | -1,863 | ,306 | ,625 |
| X3 | 3,000 | 5,000 | -,351 | -1,433 | -,732 | -1,494 |
| X2 | 3,000 | 5,000 | -,324 | -1,324 | -,659 | -1,344 |
| X1 | 3,000 | 5,000 | ,070 | ,286 | -,837 | -1,709 |
| Multivariate | | | | | 23,387 | 3,942 |

From the research results, the normality test results are obtained which can be seen as follows:

**Outlier**

Outliers are observational conditions of data that have unique characteristics that look very different from other observations. A data set is an outlier if it has p1 and p2 values less than 0.05.

Table 11. Outlier

| Observation number | Mahalanobis d-squared | p1 | p2 |
|---|---|---|---|
| 95 | 44,741 | ,001 | ,113 |
| 20 | 39,732 | ,005 | ,102 |
| 48 | 39,125 | ,006 | ,027 |
| 53 | 37,294 | ,011 | ,023 |
| 15 | 32,836 | ,035 | ,276 |
| 26 | 32,621 | ,037 | ,168 |
| 91 | 32,160 | ,042 | ,124 |
| 76 | 31,210 | ,052 | ,155 |
| 98 | 29,047 | ,087 | ,506 |
| 10 | 28,710 | ,094 | ,463 |
| 94 | 28,437 | ,099 | ,410 |
| 47 | 27,998 | ,109 | ,414 |
| 81 | 27,707 | ,117 | ,382 |
| 85 | 27,497 | ,122 | ,332 |
| 59 | 27,478 | ,122 | ,238 |
| 63 | 27,297 | ,127 | ,198 |
| 9 | 27,025 | ,135 | ,184 |
| 82 | 25,788 | ,173 | ,467 |
| 7 | 24,878 | ,206 | ,693 |
| 72 | 24,831 | ,208 | ,617 |
| 11 | 24,700 | ,213 | ,570 |

| | | | |
|---|---|---|---|
| 2 | 24,605 | ,217 | ,510 |
| 3 | 24,445 | ,224 | ,477 |
| 6 | 24,353 | ,227 | ,419 |
| 23 | 24,044 | ,240 | ,450 |
| 99 | 23,952 | ,244 | ,396 |
| 73 | 23,873 | ,248 | ,341 |
| 19 | 23,860 | ,249 | ,266 |
| 75 | 23,841 | ,249 | ,203 |
| 92 | 23,805 | ,251 | ,155 |
| 41 | 23,602 | ,260 | ,154 |
| 5 | 23,493 | ,265 | ,131 |
| 78 | 23,324 | ,273 | ,123 |
| 71 | 22,892 | ,294 | ,184 |

| Observation number | Mahalanobis d-squared | p1 | p2 |
|---|---|---|---|
| 43 | 22,858 | ,296 | ,141 |
| 80 | 22,411 | ,319 | ,216 |
| 37 | 22,346 | ,322 | ,178 |
| 97 | 22,305 | ,324 | ,139 |
| 36 | 22,178 | ,331 | ,126 |
| 29 | 21,609 | ,362 | ,245 |
| 56 | 21,512 | ,368 | ,218 |
| 90 | 21,066 | ,393 | ,326 |
| 1 | 20,945 | ,400 | ,306 |
| 77 | 20,766 | ,411 | ,312 |
| 21 | 20,296 | ,440 | ,455 |
| 16 | 19,842 | ,468 | ,601 |
| 93 | 19,838 | ,468 | ,524 |
| 30 | 19,330 | ,500 | ,695 |
| 88 | 19,234 | ,507 | ,667 |
| 28 | 19,171 | ,511 | ,624 |
| 100 | 18,918 | ,527 | ,672 |
| 35 | 18,868 | ,530 | ,622 |
| 24 | 18,852 | ,531 | ,552 |
| 69 | 18,523 | ,553 | ,642 |
| 79 | 18,494 | ,555 | ,580 |
| 18 | 18,493 | ,555 | ,501 |
| 83 | 18,475 | ,556 | ,431 |
| 17 | 18,324 | ,566 | ,430 |
| 60 | 18,241 | ,572 | ,394 |
| 13 | 17,720 | ,606 | ,590 |
| 57 | 17,684 | ,608 | ,529 |
| 8 | 17,546 | ,617 | ,522 |
| 67 | 17,432 | ,625 | ,502 |
| 74 | 17,405 | ,627 | ,434 |
| 68 | 17,373 | ,629 | ,371 |
| 49 | 17,238 | ,637 | ,361 |
| 70 | 16,860 | ,662 | ,480 |
| 62 | 16,476 | ,687 | ,604 |
| 25 | 16,265 | ,700 | ,634 |
| 22 | 16,053 | ,713 | ,662 |
| 34 | 16,047 | ,714 | ,582 |

| | | | |
|---|---|---|---|
| 27 | 15,856 | ,726 | ,599 |
| 14 | 15,544 | ,744 | ,678 |
| 54 | 15,383 | ,754 | ,677 |
| 58 | 15,036 | ,774 | ,762 |
| 40 | 14,571 | ,800 | ,871 |
| 32 | 14,391 | ,810 | ,874 |

| Observation number | Mahalanobis d-squared | p1 | p2 |
|---|---|---|---|
| 4 | 14,195 | ,820 | ,880 |
| 44 | 13,894 | ,836 | ,911 |
| 50 | 13,832 | ,839 | ,882 |
| 52 | 13,539 | ,853 | ,909 |
| 64 | 12,587 | ,894 | ,992 |
| 66 | 12,409 | ,901 | ,991 |
| 39 | 12,301 | ,905 | ,987 |
| 12 | 12,276 | ,906 | ,976 |
| 55 | 12,107 | ,912 | ,972 |
| 65 | 11,815 | ,922 | ,977 |
| 42 | 11,815 | ,922 | ,954 |
| 87 | 11,716 | ,925 | ,931 |
| 45 | 11,225 | ,940 | ,963 |
| 38 | 10,386 | ,961 | ,994 |
| 96 | 10,377 | ,961 | ,983 |
| 46 | 10,357 | ,961 | ,959 |
| 31 | 10,175 | ,965 | ,937 |
| 86 | 9,778 | ,972 | ,938 |
| 84 | 8,299 | ,990 | ,996 |
| 89 | 7,976 | ,992 | ,991 |
| 61 | 7,874 | ,993 | ,962 |
| 33 | 7,391 | ,995 | ,916 |
| 51 | 4,702 | 1,000 | ,983 |

The Mahalanobis distance table, there are p1 and p2 values below 0.05. This condition indicates that there are outliers.

**Multicollinearity and Singularity**

Multicollinearity and singularity can be done by detecting the determinant value of the covariance matrix. If the value of the determinant of the matrix is far from zero, it can be concluded that it is valid.

In the multicollinearity and singularity images, it can be seen that the determinant value of the sample covariance matrix = 0.000. This value does not mean that the determinant is 0 but has a value so that it can be concluded that there are no multicollinearity and singularity problems in the data being analyzed.

Table 12. Multicollinearity and Singularity

**Sample Covariances (Group number 1)**

| | Y5 | Y4 | Y3 | Y2 | Y1 | X13 | X14 | X15 | X6 | X7 | X8 | X9 | X10 | X11 | X12 | X5 | X4 | X3 | X2 | X1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y5 | ,317 | | | | | | | | | | | | | | | | | | | |
| Y4 | ,184 | ,421 | | | | | | | | | | | | | | | | | | |
| Y3 | ,187 | ,177 | ,230 | | | | | | | | | | | | | | | | | |
| Y2 | -,089 | -,067 | -,108 | ,532 | | | | | | | | | | | | | | | | |
| Y1 | ,142 | ,110 | ,138 | -,124 | ,186 | | | | | | | | | | | | | | | |
| X13 | ,072 | ,131 | ,079 | -,034 | ,065 | ,226 | | | | | | | | | | | | | | |
| X14 | ,108 | ,064 | ,106 | -,099 | ,103 | ,061 | ,220 | | | | | | | | | | | | | |
| X15 | ,100 | ,052 | ,082 | -,054 | ,082 | ,049 | ,143 | ,290 | | | | | | | | | | | | |
| X6 | ,106 | ,117 | ,121 | -,078 | ,117 | ,050 | ,083 | ,089 | ,254 | | | | | | | | | | | |
| X7 | -,058 | -,053 | -,025 | -,065 | ,000 | -,072 | ,005 | -,030 | ,042 | ,768 | | | | | | | | | | |
| X8 | ,046 | ,087 | ,081 | -,078 | ,077 | ,090 | ,073 | ,009 | ,084 | ,033 | ,294 | | | | | | | | | |
| X9 | -,030 | -,012 | -,032 | -,046 | -,052 | ,001 | ,047 | ,000 | ,011 | ,280 | ,011 | ,890 | | | | | | | | |
| X10 | ,033 | -,028 | -,001 | -,048 | -,021 | ,043 | ,039 | ,045 | -,007 | ,082 | ,013 | ,085 | ,530 | | | | | | | |
| X11 | ,015 | -,026 | -,031 | ,024 | -,003 | -,033 | -,015 | -,033 | ,009 | ,233 | -,081 | ,243 | ,014 | ,798 | | | | | | |
| X12 | ,135 | ,157 | ,112 | -,114 | ,132 | ,084 | ,133 | ,030 | ,104 | ,025 | ,204 | ,020 | ,000 | -,088 | ,520 | | | | | |
| X5 | ,060 | ,117 | ,097 | -,061 | ,074 | ,133 | ,052 | ,028 | ,105 | -,022 | ,155 | -,038 | -,016 | -,094 | ,173 | ,253 | | | | |
| X4 | ,140 | ,123 | ,113 | -,109 | ,106 | ,097 | ,128 | ,032 | ,175 | -,027 | ,135 | -,012 | -,004 | -,046 | ,217 | ,137 | ,513 | | | |
| X3 | ,096 | ,098 | ,112 | -,108 | ,106 | ,071 | ,081 | ,056 | ,167 | -,060 | ,067 | -,006 | -,033 | -,041 | ,126 | ,084 | ,286 | ,422 | | |
| X2 | ,056 | ,034 | ,068 | -,060 | ,072 | ,053 | ,075 | ,076 | ,159 | -,030 | ,059 | ,044 | -,013 | -,035 | ,116 | ,068 | ,272 | ,290 | ,378 | |
| X1 | ,072 | ,048 | ,066 | -,075 | ,069 | ,049 | ,072 | ,077 | ,135 | ,025 | ,075 | ,053 | -,013 | ,003 | ,087 | ,086 | ,184 | ,245 | ,241 | ,284 |

Condition number = 54,982

Eigenvalues
2,010 1,357 ,714 ,659 ,575 ,545 ,455 ,386 ,308 ,267 ,202 ,164 ,136 ,123 ,110 ,088 ,074 ,066 ,048 ,037

Determinant of sample covariance matrix = ,000

**Conformity Test**

After validation and reliability tests, a temporary research model was obtained as shown in the figure below:

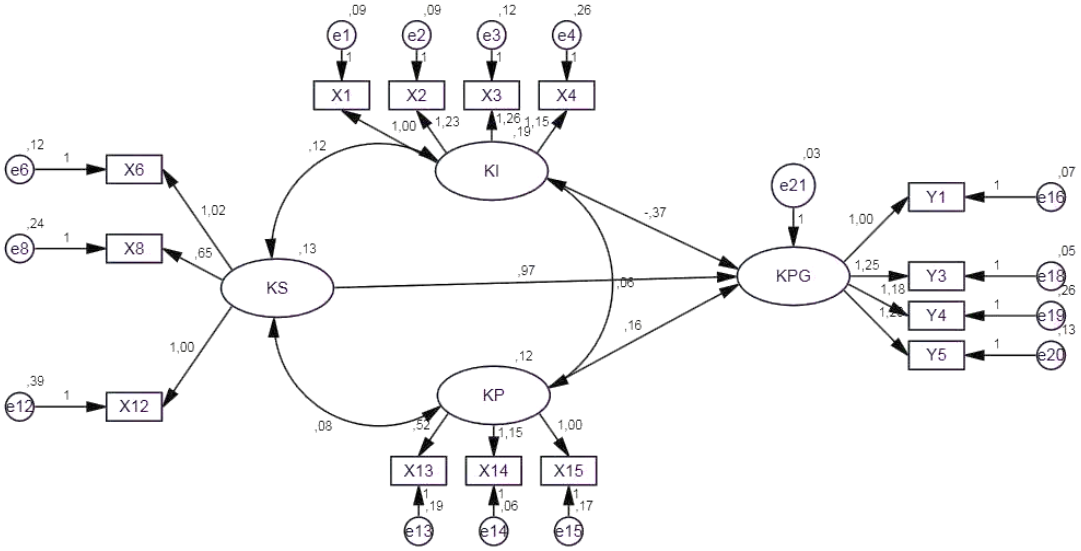


Fig 2. Research Model After Validity and Reliability Test

To declare a model fit (acceptable) or not, it is necessary to conduct a thorough model test to measure the fit between the sample covariance matrix (observation data) and the covariance matrix. The main criteria as a basis for decision making are; if *probability(*P) ≥ 0.05 then the sample variance-covariance matrix is equal (not different) to the presumptive population variance-covariance matrix, meaning the *fit model*. Conversely, if the P value ≤ 0.05, then the model is not *fit*.

The results of the model suitability test are known to have *a Probability* value less than the recommended value, which is less than 0.05. This means that the theoretical model proposed in this study is not in accordance with the observed population model only applies to samples.

Table 13. Model Conformity Test Results

| Fit Size | Critical Value Limit | Model Test Results | Information |
|---|---|---|---|
| ***a. Absolute Fit Measure*** | | | |
| 1. Chi-Square $X^2$ (CMIN) | Kecil, $\leq$ 2 α; df | 137,970 | Bad |
| 2. Probability | $\geq$ 0,05 | 0,000 | Bad |
| 3. Chi-Square $X^2$ Relatif (CMIN/DF) | $\leq$ 2,0 | 1,943 | Bad |
| 4. GFI | $\geq$ 0,90 | 0,839 | Bad |
| 5. RMSEA | $\leq$ 0,08 | 0,098 | Bad |
| ***b. Incremental Fit Measure*** | | | |
| 1. AGFI | $\geq$ 0,90 | 0,763 | Bad |
| 2. TLI | $\geq$ 0,95 | 0,864 | Bad |
| 3. NFI | $\geq$ 0,90 | 0,808 | Bad |
| 4. CFI | $\geq$ 0,95 | 0,894 | Bad |
| **c. *Parsimonious Fit Measures*** | | | |
| 1. PNFI | $\geq$ 0,60 | 0,631 | Bad |
| 2. PGFI | $\geq$ 0,60 | 0,567 | Bad |

Because the P value does not meet the requirements, other criteria tests such as; Absolute fit measures, incremental fit measures, and parsimonious fit measures are discontinued.

**Significance Test**

The significance test is intended to determine whether the causal relationship between variables is significant or non-significant. If in the signification test obtained a negative regression coefficient (S.E) value (-) or a signification value (Sig) > 0.05, then a non-significant causal relationship occurs. If such conditions occur, the relationship between these variables must be removed.

Table 14. Path Model Significance Test

| | Estimate | S.E. | C.R. | Sig | Information |
|---|---|---|---|---|---|
| KPG <---KS | ,975 | ,500 | 1,948 | ,051 | Non significant causal relationship |
| KPG <---KP | ,160 | ,248 | ,644 | ,520 | Non significant causal relationship |
| KPG <---KI | -,366 | ,258 | -1,417 | ,157 | Non significant causal relationship |

Based on the above, it was found that the proposed H1 hypothesis, namely: allegedly system quality, service quality, and information quality did not have a significant effect on user satisfaction, was accepted. Thus, it can be concluded that the Rumah Belajar application used today is unsatisfactory and has not been effective in use in the field of education, especially for some existing learning problems.

## 4. CONCLUSION

The success model used in this study is using the DeLone and McLean success model which only uses variables of information quality, system quality, service quality, and user satisfaction. The proposed H1, namely: allegedly system quality, service quality, and information quality do not have a significant effect on user satisfaction, is accepted. Thus, it can be concluded that the Rumah Belajar application used today is unsatisfactory and has not been effective in use in the field of education, especially for some learning problems. The use of Rumah Belajar application is currently quite positive, but some users feel that the application is less attractive in terms of appearance and in the system. Users also feel that the Rumah Belajar application is less relevant to use in terms of existing material and appearance, this is evidenced by the rejection of the X5 indicator which is a relevant system indicator to use.

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