

## Influence of UI Design Elements to a User-Friendly Learning Experience for Vocational School Students Department of DKV

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### Abstract

Over time, e-learning mobile applications were found, one of which was Skill Academy, which began to pay attention to the arrangement of its user interface (UI) design. The Skill Academy e-learning mobile application is suitable for supporting mastery of skills because there are materials that match the learning needs of SMK students in the Visual Communication Design department. The role of structuring UI design elements in e-learning mobile applications is important because it can be a means to build interest in learning to completion for students. Interest in learning arises because users feel that the UI design on learning media has met the user-friendly rules. A well laid out UI design will certainly give a different impression when compared to a makeshift one. Now the presence of the application which has begun to pay attention to the arrangement of the UI design display is the background for writing this research. The purpose of this study was to determine the effect of structuring UI design elements on a user-friendly learning experience for its users. The method used is the mixed method method. The quantitative method uses experimental tests in the form of data analysis from questionnaires compiled from UI design theory and UEQ+, with respondents being students majoring in Visual Communication Design at SMKN Purwosari Bojonegoro. While the qualitative method is a theoretical study of UI and usability. The result of the research is that the UI design has a significant effect on the user-friendly learning experience. As for UI design elements, only typography and image elements have a significant effect compared to other elements.

### Keywords

User interface (UI); learning experience; user friendly



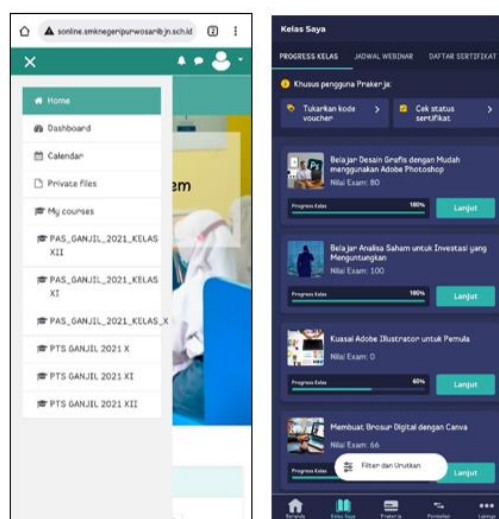
## I. Introduction

E-learning as a learning medium has actually existed for a long time. However, its existence at that time was still limited because it was constrained from the aspect of Human Resources who were not ready to deal with technical or non-technical matters. The obstacles related to technical matters, for example, the design of the user interface (UI) and user experience (UX) on e-learning as learning content are still impressed as they are (less aesthetic). Meanwhile, problems related to non-technical matters such as the existing human resources are not yet qualified, and technology upgrades are not as fast as now, in the sense that they can only be accessed through the website via a desktop computer. The learning is aimed at reconstructing students who are looking for information and finding out knowledge that is able to solve problems, cooperate, and tolerate diversity. If the desire is successful in a satisfying way, it will increase students' self-confidence as well as a high sense of responsibility and civilized humans who can identify themselves with stable, independent personalities and have emotional stability with intellectual knowledge. (Pradana, D. et al. 2020)

One thing that can be observed from the design side of the e-learning UI is that it still seems as it is, such as that of the Purwosari Bojonegoro State Vocational High School (SMKN). There are 2 things that can be found in the UI design problem of the school's e-learning media. The first is the unavailability of access to e-learning for students via applications on smartphones. Because it is not available via an application, when you want to access it on a mobile, you have to use the browser on your smartphone. Second, considering that the smartphone screen is smaller than a computer desktop screen, the UI looks as if it was just compressed from the desktop version to the mobile version. There is no arrangement and categorization (layout of design elements) on the menu of materials, assignments, exams, etc. in the UI specifically on the mobile version, so it seems less user friendly.

The term user friendly is synonymous when users feel easy, comfortable, and at home when operating a computer program or mobile application. The role of user friendly UI design (in this case in the mobile version of e-learning) can help, and simplify the flow in understanding learning content by students. Because according to research, there are some users who feel uncomfortable accessing it because of its poor UI (Hartadi, 2020) (Rochmawati, 2019). There are ways that can be done, such as categorizing the menu on the UI display in the navigation system. Then arrange it (layout) using a grid system that has been adapted to the mobile version. In addition, the selection and consistency of colors, icon shapes, typography, empty space, are also important elements to support this.

As time goes by, it is now possible to find e-learning that pays attention to the UI design aspect of the mobile version. Due to its mobile nature, the media can also be integrated with other features and/or applications on smartphones such as biometric login features, QR code scanners, etc. As one example is the Skill Academy application released by Ruangguru. In contrast to Ruangguru, the application which was present in September 2019 is an online learning application that provides a variety of training materials so that users can master certain skills or expertise. Currently, users can enjoy the application as a mobile learning medium because only the Play Store remains. Its existence in the community is also widely known because it is trusted as a training partner for the Pre-Employment Card program by the Government. This statement is certainly in line with the download data of the two applications via the Play Store. It can be seen that the Skill Academy application has been downloaded by more than 1 million users.



**Figure 1.** UI design display comparisone-learning SMKN Purwosari Bojonegoro (left) and applicationsSkill Academy(right)  
[Source: researcher documentation]

As e-learning media, both can be used to support educational goals in SMK. The orientation of education in SMK is to provide useful skills and knowledge training for students to master certain areas of expertise professionally. Teaching and learning methods in SMK are more focused on the concept of concrete thinking (experience-based) as the main method (Usman, 2016: 17). It is said to be supportive because the application contains training materials that match one of the vocational interests in SMK, namely Visual Communication Design.

The target audience, especially in this case, SMK students need a user-friendly learning experience when interacting with the application, as their starting point to easily understand the material. The experience or impression of the audience in this case UX can be created because of the role of UI design elements in the application. A UI design with well-organized design elements will certainly give a different impression when compared to a makeshift UI design. Now with the presence of e-learning which has begun to pay attention to aspects of the UI design display on the mobile version, this is the background for writing this research. This study was conducted to determine the effect of the UI design elements of the Mobile e-learning Skill Academy on a user-friendly learning experience for its users.

According to Tidwel (2020) there are design elements that make up the UI in the application including layout, color, typography, and images. These technical elements will be used as a reference for measuring independent variables in the questionnaire. The first technical element, namely layout, is related to the arrangement of visual hierarchy, visual flow (navigation), and consistency of layout. The second technical element is the color aspect related to color selection, and color contrast. Furthermore, the third element is typography which is related to typography selection, and typographic consistency. Then the last is the image element which includes the selection of images and videos, as well as the consistency of images and videos.

Referring to Webster's online dictionary (2022), the term user friendly is an adjective which means easy to learn (easy to understand), use (used), and understand. These adjectives can appear because the product has complied with the User Centered Design (UCD). This means that the product has met the expectations and needs of its users. The way that can be done so that a product design meets UCD is to apply design principles and elements in order to create reusability (Lowdermilk, 2013: 15). So that in this study the authors say that the nature of being user friendly is related to the nature of usability. These properties can also be understood as product functionality according to user perceptions.

Usability in UI design according to the ISO 9241-11 standard includes 3 aspects, namely effectiveness, efficiency, and satisfaction. Of these three aspects, if it is associated with a user friendly learning experience, the intersecting aspect is found in the satisfaction aspect. The two intersect because the understanding between the two has something in common. There are many methods that can be used to measure user satisfaction in usability. One of them used in this study refers to the UEQ+ by Schrepp (2020). In UEQ+, the measurement of the usability of mobile e-learning designs as a learning platform consists of 11 categories. The 11 categories include: 1) Quality of Content; 2) The level of trust in the content (Trustworthiness of Content); 3) Usefulness (Usefulness); 4) Clarity of display (Clarity), 5) Clarity (Perspicuity); 6) Efficiency (Efficiency); 7) Level of trust (Trust); 8) Level of reliability (Dependability); 9) Attractiveness; 10) Stimulation (Stimulation); and 11) Novelty.

Thus, referring to this explanation, it can be defined that a user friendly design is a UI design on a product that has these 11 properties (characters) in the eyes of its users. Of course, this definition only covers UI design on the learning platform, which is the focus of

this research. This definition can change according to the focus of research taken by other researchers. So that explanations related to design elements in the UI will be borrowed and set as independent variables (variable X). Meanwhile, the definition of a user friendly learning experience based on the usability aspect was also borrowed and set as the dependent variable (variable Y). The formulation of the questions in the questionnaire refers to these two things.

## II. Review of Literature

This research is mixed research in the form of usability test with an explanatory approach through case studies. The explanatory approach means trying to prove, and explain the influence between the two variables that have been formulated. In the first stage, the qualitative method was used to obtain an explanation regarding the design elements in the UI as well as the definition of a user-friendly learning experience. Both definitions are sourced from journals, books, and other online sources. Qualitative methods are also used as a discussion of research results using previously defined theoretical sources.

The quantitative method is a usability test with a quasi-experimental approach using a questionnaire as a measuring tool for the influence of the X variable on the Y variable. The case study conducted is to see the effect of the research object on the research subject. The case study is also a limitation of the problem in this research. The object of research that was determined was UI Design on the Skill Academy online learning application. While the research subjects were students majoring in Visual Communication Design (DKV) at the State Vocational High School (SMKN) Purwosari Bojonegoro. Referring to the case study then a hypothesis is established. Then the formulation of the hypothesis will be proven through experimental tests using SPSS 26 software.

### 2.1 Data collection technique

Quantitative data collection in this study uses questionnaire questions that refer to the definitions of the variables X and Y. Before the respondents fill out the questionnaire, the UI usability test stimulus is given by doing the task completion procedure first. The assignments given refer to student activities when interacting with the application when it is first installed to using it in independent study using a smartphone. The tasks performed are presented in table 1 below.

**Table 1.** Skill Academy application task completion

No	Task	Skill Academy App Job Description
1	Task 1	<i>Register</i> and sign in to the app. Edit account and fill in your personal data according to your identity, click save.
2	Task 2	Look for a class with a material entitled “Learn Graphic Design Easily using Adobe Photoshop”, speaker Bimo Satria Mukti. Click buy online class. Listen to the material presented.
3	Task 3	Play a class preview video with the material.
4	Task 4	Look for class progress and a list of certificates.
5	Task 5	How much is the price for a class with a material entitled “Mastering Adobe Illustrator for Beginners”, the presenter is Edi Sarwono? Please write in the dots below.

After completing the assigned task, the respondent then filled out a questionnaire to provide a rating about their experience interacting with the UI Skill Academy application. The indicators for the questionnaire questions on the X variable according to Tidwell (2020) are presented in table 1 below. The question variable X uses a 7-level Likert scale. A score of 1 is strongly disagree to a score of 7 is strongly agree.

**Table 2.** Indicator question questionnaire variable X

Dimension	Indicator	Description	Experiment Question
UI Design Elements	Layout	a. L1 - Visual hierarchy	1
		b. L2 - Visual flow (navigation)	2
		c. L3 - Layout consistency	3, 4
	Color	a. W1 - Color selection	5, 6
b. W2 - Color contrast		7, 8	
Typography	a. T1 - Typography selection	9, 10	
	b. T2 - Typographic consistency	11, 12	
Picture	a. G1- Image and video selection	13	
	b. G2 - Image and video consistency	14, 15	

(Source: Tidwell, 2020)

Furthermore, the indicators of the questionnaire questions on the Y variable referring to Schrepp (2020: 16) are presented in table 2 below. Questionnaire questions on variable Y based on UEQ+ are semantic differential scale questions with 7 levels. A minimum of 1 point placed on the left position has the most negative value, while a maximum of 7 points placed on the right position has the most positive value.

**Table 3.Y.** variable questionnaire question indicator

<b>1. Quality of Content</b>
1. Obsolete-latest 2. Not attractive 3. Not well-prepared- well-prepared 4. Unintelligible-understandable 5. Completely irrelevant-very important
<b>2. Level of trust in content (Trustworthiness of Content)</b>
1. Useless-useless 2. It doesn't make sense 3. Untrustworthy-trustworthy 4. Inaccurate-accurate 5. Completely irrelevant-very important
<b>3. Usefulness</b>
1. Useless-useless 2. Not helping 3. Not profitable 4. Not useful-beneficial 5. Completely irrelevant-very important
<b>4. Clarity of display (Clarity)</b>
1. Poorly classified-well-classified 2. Unstructured-structured 3. Not in order 4. Irregular 5. Completely irrelevant-very important

<b>5. Clarity (Perspicuity)</b>
1. Incomprehensible-understandable 2. Difficult to learn-easy to learn 3. Complicated-easy 4. Confusing-obviously 5. Completely irrelevant-very important
<b>6. Efficiency</b>
1. Slow down 2. Not efficient 3. Not practical 4. Unstructured-structured 5. Completely irrelevant-very important
<b>7. Level of trust (Trust)</b>
1. Not safe 2. Untrustworthy-trustworthy 3. Unreliable-reliable 4. Not transparent-transparent 5. Completely irrelevant-very important
<b>8. Level of reliability (Dependability)</b>
1. Unpredictable-predictable 2. Inhibiting-supporting 3. Not guaranteed 4. Not as expected-according to expectations 5. Completely irrelevant-very important
<b>9. Attractiveness</b>
1. Annoying-fun 2. Ugly-good 3. Not comfortable 4. Not friendly 5. Completely irrelevant-very important
<b>10. Stimulation</b>
1. Not attractive 2. Boring-exciting 3. Worthless 4. Reducing motivations 5. Completely irrelevant-very important
<b>11. Novelty (Novelty)</b>
1. Not creative-creative 2. Conventional-original 3. Ordinary-superior 4. Conservative-innovative 5. Completely irrelevant-very important

Questionnaire questions will be tested for validity with the Pearson correlation formula and reliability with Cronbach's Alpha formula first. The two tests also only apply to the questionnaire that measures the X variable only. This is because the questionnaire was made by the researcher himself, its validity and reliability have not been tested. The results of the two tests are presented in the results of data analysis. The qualitative data was collected using theories related to the research topic. Then correlated in the results and discussion section.

## 2.2 Research Sample

The population in this study were students in grades 10, 11, and 12 in the DKV department of SMKN Purwosari Bojonegoro in the 2021/2022 academic year. There are 2 DKV class 10 students with a total of 68 children, 36 DKV class 11 students, and 36 DKV class 12 students. The total population is 140 students. The selection of the population is because the application under study is a learning application. In this application, there are material topics that are directly related to SMK subjects in the Visual Communication Design Department, namely computer graphics.

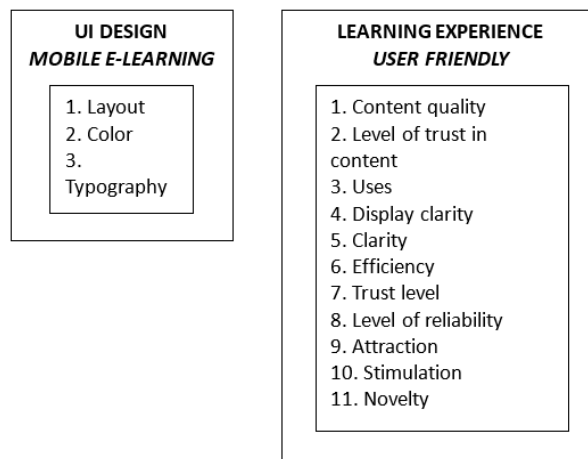
Furthermore, the selection of the sample is determined using non-probability sampling, namely the selected sample does not provide equal opportunities for members of the population. The consideration is that during the research period (April – May 2022) the 11th DKV class was doing an internship. Furthermore, class 12 DKV is preparing for the School Examination and Expertise Competency Examination. Therefore, the sample selection used purposive sampling so that only 68 students of class 10 DKV were selected as respondents. The number of samples in this study has a minimum target of 30 respondents. This is in accordance with Sugiyono's opinion (2019: 143) that the sample size in experimental research ranges from 30 to 500 respondents.

## 2.3 Data analysis

Analysis of quantitative data in this study using statistical tests. A series of data analysis processes starting from the validity test, and the reliability test. Then after the data from the questionnaire was declared valid and reliable, it was continued to test the hypothesis using linear regression. Linear regression test is used to prove the effect of variable X and variable Y. The prerequisites for linear regression test must be met first, namely in the form of classical assumption test including normality test, multicollinearity test, and heteroscedasticity test. In addition to the classical assumption test, homogeneity test was also carried out. After all the test prerequisites are met, the hypothesis test can be carried out.

## 2.4 Research paradigm

Variable X is the visual appearance of a UI design in an application according to Tidwell (2020) which is built by 4 design elements including: 1) Layout; 2) Color; 3) Typography; and 4) Fig. While the Y variable is a measurement related to a user friendly learning experience referring to the UEQ + (Schrepp, 2020: 16). The learning experience was measured using 11 categories including: 1) Quality of Content; 2) The level of trust in the content (Trustworthiness of Content); 3) Usefulness (Usefulness); 4) Clarity of appearance (Clarity), 5) Clarity (Perspicuity); 6) Efficiency (Efficiency); 7) Level of trust (Trust); 8) Level of reliability (Dependability); 9) Attractiveness; 10) Stimulation (Stimulation); and 11) Novelty. This research paradigm aims to describe the variables to be studied.



**Figure 2.** Research paradigm  
[Source: researcher documentation]

### III. Result and Discussion

#### 3.1 Validity test

A question in the questionnaire that was just compiled by the researcher needs to be tested for validity on 30 randomly selected respondents first so that the statement items are valid. The test uses the Pearson correlation formula using SPSS 26. This validity test is used on the indicators of the questionnaire questions on the variable X. The results of the validity test are presented in table 4. Based on the test results, all indicators of the question variable X are declared valid because the value of  $r_{count} > r_{table}$  ( $r_{table}$  for 30 respondent is 0.361), and the significance value is  $< 0.05$ .

**Table 4.X** Variable Validity Test Results

Variable	Indicator	No. Items	rcount	rtable	Sig. (p-value)
Layout	L1	1	0.363	0.361	0.048
	L2	2	0.676	0.361	0.000
	L3	3	0.656	0.361	0.000
		4	0.550	0.361	0.002
Color	W1	5	0.510	0.361	0.004
		6	0.570	0.361	0.001
	W2	7	0.567	0.361	0.001
		8	0.529	0.361	0.003
Typography	T1	9	0.405	0.361	0.026
		10	0.541	0.361	0.002
	T2	11	0.526	0.361	0.003
		12	0.535	0.361	0.002
Picture	G1	13	0.436	0.361	0.016
	G2	14	0.627	0.361	0.000
		15	0.441	0.361	0.015

(Source: SPSS 26 data processing)

#### 3.2. Reliability Test

Just like the validity test, a question in a questionnaire that has just been prepared by the researcher needs to be tested for reliability on 30 randomly selected respondents first in order to be declared reliable. The reliability test in this study used the calculation of



Cronbach's alpha with SPSS 26. In tables 5 and 6 the questionnaire variable X was declared reliable because the value of Cronbach's alpha > rtable for 30 respondents was 0.361). From the two tests above, it can be concluded that the questionnaire is valid and reliable. So that the trial questionnaire can be used to collect data for hypothesis testing on 68 respondents who have been previously determined.

**Table 5.** X Variable Reliability Test Results

Variable	N	Cronbach's alpha . value	rtable
UI Design Elements	9	0.814	0.361

(Source: SPSS 26 data processing)

**Table 6.** Reliability Test Results on each indicator

Variable	Indicator	Cronbach's alpha . value	rtable
Layout	L1	0.840	0.361
	L2	0.780	0.361
	L3	0.775	0.361
Color	W1	0.817	0.361
	W2	0.781	0.361
Typography	T1	0.782	0.361
	T2	0.790	0.361
Picture	G1	0.791	0.361
	G2	0.795	0.361

(Source: SPSS 26 data processing)

### 3.3 Classic assumption test

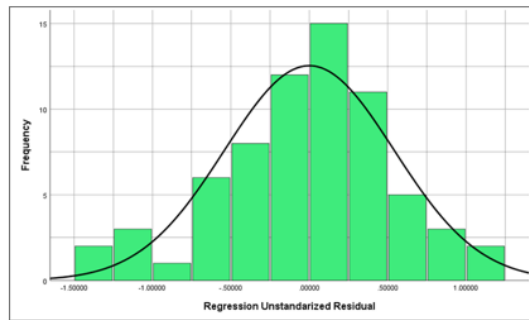
The classical assumption test is a prerequisite test used before testing the hypothesis using linear regression. The prerequisite test includes 3 tests, namely normality test, multicollinearity test, and heteroscedasticity test. The normality test of the data in this study used the Kolmogorov-Smirnov test (table 7), observing the histogram (figure 2), and the PP Plot (figure 3). Calculations using SPSS 26, in table 7 it is observed that the residual data is normally distributed because the significance value is > 0.05.

**Table 7.** Kolmogorov-Smirnov. normality test results

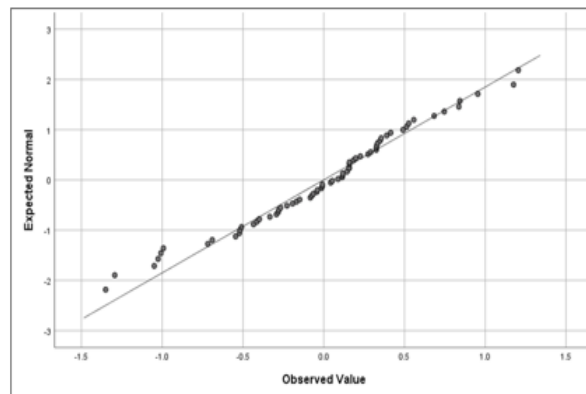
Asymp Sig. (2-tailed)	N
0.200c,d	68

(Source: SPSS 26 data processing)

Other normality test results can be seen in Figures 2 and 3. In Figure 2, it can be seen that the residual data is normally distributed, because the shape of the data distribution is like a symmetrical bell. While in Figure 3 the residual data is also normally distributed, because the distribution of plot points is almost completely attached to the trend line.



[Source: SPSS 26 Data Processing]  
**Figure 3.** Residual data histogram



[Source: SPSS 26 Data Processing]  
**Figure 4.** Normal PP Plot Residue

**Table 8.** Multicollinearity test results

<b>Tolerance</b>	<b>VIF</b>	<b>N</b>
0.342	2,925	68

(Source: SPSS 26 data processing)

The multicollinearity test uses the tolerance value and the Variance inflation factor (VIF) value. Multicollinearity test using SPSS 26. In table 8 it can be observed that the residual tolerance value is  $0.342 > 0.10$ . Similarly, the VIF value obtained was  $2,925 < 10.00$ . So, it can be concluded that the regression model does not occur multicollinearity.

**Table 9.** Heteroscedasticity test results

<b>Sig. (p-value)</b>	<b>N</b>
0.706	68

(Source: SPSS 26 data processing)

Furthermore, the heteroscedasticity test used the Spearman's rho correlation test. Heteroscedasticity test using SPSS 26. In table 9 it can be observed that the significance value is  $0.706 > 0.05$ . So it can be concluded that there is no heteroscedasticity. Thus, from all the test results, the data obtained have met all the classical assumption tests.

### 3.4 Homogeneity Test

In addition to the classical assumption test, homogeneity test is also needed as a prerequisite for hypothesis testing. Homogeneity test using Levene statistic with SPSS 26. In table 10 it can be observed that the significance value is  $0.08 > 0.05$ . So it can be concluded that the variance of the data distribution is homogeneous. Thus, from the results of all the prerequisite tests, both the classical assumption test and the homogeneity test, it can be said that they have met the requirements to test the hypothesis using linear regression.

**Table 10.** Homogeneity test results

<i>Sig. (p-value)</i>	<b>N</b>
0.08	68

(Source: SPSS 26 data processing)

### 3.5 Linear Regression Test

Linear regression test was used as a hypothesis test. Hypothesis test is an effect test using one way ANOVA. In table 11 it can be seen that it is proven that the X variable has a significant effect on the Y variable, because the significance value is  $0.00 < 0.05$ . Furthermore, in table 12 the magnitude of the influence of the X variable on the Y variable as seen from the R square value is 0.556 or 56%. Then it can be observed that the correlation between X and Y with an R value of 0.746 is a strong positive correlation in Sugiyono (2021: 231).

**Table 11.** One way ANOVA test results on simple linear regression

<i>one way ANOVA</i>	<i>Sig. (p-value)</i>	<b>N</b>
	0.00	68

(Source: SPSS 26 data processing)

**Table 12.** Correlation coefficient test results in simple linear regression

<b>R</b>	<b>R Square</b>	<b>AdjustedR Square</b>	<b>Sig.</b>
0.746	0.556	0.549	0.00

(Source: SPSS 26 data processing)

In table 13, it can be observed that only typography sub-variables, and images only have a significant and positive correlation to variable Y. It can be observed that the significance value of the typographic sub-variable is  $0.01 < 0.05$ , and the sub-variable 0 is  $0.02 < 0.05$ .

**Table 13.** Multiple linear regression test results

<b>Sub-variable</b>	<b>B</b>	<b>Sig.</b>
<i>Layout</i>	0.146	0.361
<i>Color</i>	0.048	0.764
<i>Typography</i>	0.570	0.01
<i>Picture</i>	0.496	0.02

(Source: SPSS 26 data processing)

### 3.6 Discussion

The results of the linear regression test prove that the formulated hypothesis is accepted. The UI design display on the Skill Academy application is able to provide a user-friendly learning experience for students majoring in Visual Communication Design at SMKN Purwosari Bojonegoro. This is certainly in line with Borrelli's opinion (2021: 7) that UI design on a learning platform that is well laid out can provide a psychological effect in the form of comfort for its users. The comfortable effect when using learning applications via smartphones, becomes a bridge for users to be able to enjoy and absorb the information conveyed. The comfortable effect that arises from the user means that the UI that has been designed by the designer has succeeded in fulfilling its purpose. Referring to the hypothesis.

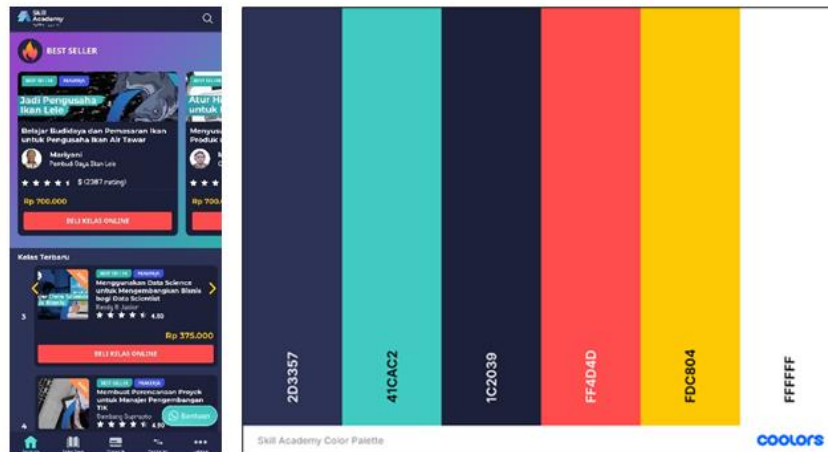
In each sub-variable, from the results of data analysis, only typography and images have a significant effect on a user-friendly learning experience. Meanwhile, the layout and color sub-variables have an effect but are not significant. This does not mean that the arrangement of UI design elements on the layout and colors is bad, but it is getting research suggestions so that they can improve even better. Looking at the results on the layout sub-variables in table 13, we get a positive influence value. This means that if the layout sub-variable increases by 1%, the user-friendly learning experience variable will increase by 0.146, assuming that the other sub-variables are constant. While the results on the color sub-variable get a positive influence value (unidirectional).



*Figure 5. Horizontal and vertical navigation pattern (combination)  
[Source: researcher documentation]*

Opinions from respondents related to the layout from the visual hierarchy aspect, the preparation of the content has been neatly and orderly arranged. Users can easily focus (not tiring the eyes) to digest information because of the role of Point of Interest (POI) in it. In

the aspect of visual flow, the arrangement of grid layouts tends to be larger with empty space that tends to be rather tight. A larger layout grid means that the content served can be loaded more and/or the display can be larger. Users find it easy to navigate and not confusing. Meanwhile, related to layout consistency tends to be less consistent. This can be seen in Figure 4 of the navigation pattern which is a combination of using horizontal and vertical scrolls.



**Figure 6.** App color choice Skill Academy  
[Source: researcher documentation]

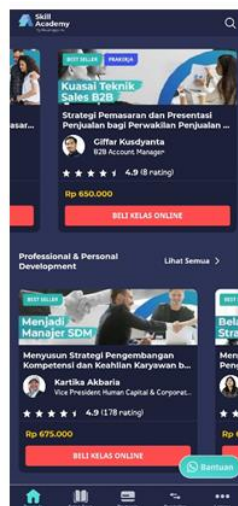
Furthermore, the color choice of the Skill Academy application in Figure 5 used tends to use strong colors (primary colors). This color choice is a highly saturated color that tends to tire the eyes. The dominant color choices used are dark blue as the background, white as the text color, and light blue, some red, and yellow are used as graphic colors. You can also observe the choice of background color, and the text also tends to be inconsistent. This is because it can be found in these applications that white is used as the background, and black is used as the text color. So based on the choice of strong colors, the color contrast value in the Skill Academy application is higher than the Advanced Incandescent.

In the typography and image sub-variables that have a significant effect on the user-friendly learning experience, table 13 also gets a positive influence value. This means that if the typography sub-variable increases by 1%, the user-friendly learning experience variable will increase by 0.570, assuming that the other sub-variables are constant. Meanwhile, if the color sub-variable has an increase of 1%, then the user-friendly learning experience variable will increase by 0.496, assuming that the other sub-variables are constant. This also means that the choice of typography and images according to the respondents has been able to provide comfort.



**Figure 7.** App typography options Skill Academy  
 [Source: researcher documentation]

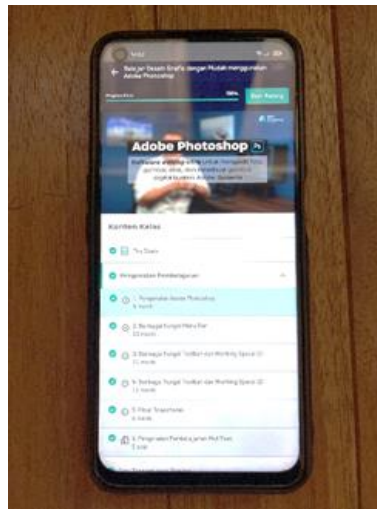
The typography selected in the Skill Academy application is of the sans-serif type. The combination of letters used is limited to 2-3 letters. The choice of letters used in the headline (title) is made a bit bold (bold). Then the body copy in Figure 6 automatically uses the reading letters used on smartphones. This means that the reading letters in the application can be adjusted according to the wishes of the user. Furthermore, with regard to size, both the title and reading letters were observed to be larger, making them easier to read. The choice of a larger font size also has implications for the appearance of the empty space which tends to be a bit tight.



**Figure 8.** App image selection Skill Academy  
 [Source: researcher documentation]

Furthermore, in Figure 7, the choice of images for the Skill Academy application in thumbnails mostly uses photographic objects with a little digital imaging processing. While

the selected icon uses a flat design style with a light blue fill. Another aspect that can be observed is the choice of learning video shows. An example is a video with the topic “Learn Graphic Design Easily using Adobe Photoshop” in Figure 8 below.



**Figure 9.** Application material video views Skill Academy  
[Source: researcher documentation]

When viewed, the selection of video shows looks consistent, well-conceived, and neat. Neatness can be observed from: 1) Presenters who wear shirts; 2) The interior of the place is designed according to the topic of the material; 3) Video shows that are edited so that users are comfortable with resolution facilities up to 1080 pixels (FHD resolution). This can mean that the video content in the Skill Academy application has been well prepared and professionally managed. In addition, in terms of the benefits of material on the same topic, the presentation of material provided by the Skill Academy application when compared to other similar applications (Incandescent for example) looks more abundant and costs less.

#### IV. Conclusion

Referring to the results and discussion, the conclusion that can be drawn is that UI design elements (variable X) have a significant effect on a user-friendly learning experience (variable Y). The percentage level of influence of UI design elements on a user-friendly learning experience is 56%. The strength of the relationship between the two variables X and Y is a strong positive relationship based on the correlation test. This means that the better the arrangement of UI design elements, the better the user-friendly learning experience that users will get. For each UI design element, the significant effect only occurs on the typography and image variables. So, it can be said that users in this case SMK students can easily use the application because it is supported by the arrangement of UI design elements that are structured in icon components, presentation of images and videos, and selected text. The characteristics of UI design elements that can be used as a reference for developing learning applications in order to provide a better user-friendly learning experience, based on the evaluation results in the discussion, are:

- Pay attention to the consistent layout of the layout in the navigation system horizontally or vertically, the provision of free space, and the arrangement of content that is not too tight.

- Pay attention to consistent, soft color choices, and color contrasts that are not too strong so as not to tire the eyes.
- Pay attention to the choice of letters that are not too varied (limited to 2-3 letters only), and are easy to read.
- Paying attention to the image selection on the thumbnail, the uniform icon refers to the existing style and becomes the reference for the application.
- Pay attention to video shows of training materials so that they are packaged and conceptualized properly and professionally because they are the backbone and core of a learning application on a smartphone.

Suggestions that can be given from the results of this study are to make a questionnaire to measure the X variable using the theory of other UI design elements. Likewise, for the measurement of the Y variable related to a user-friendly learning experience, it can be linked to other usability measurements such as using the Attrakdiff 2 questionnaire. or PC. The usability measurement for the Y variable via the website can be different, such as referring to the visAWI questionnaire. Furthermore, because the learning application contains material on work skills.

## References

- Borrelli, Lucia., Sara Perrella. (2021). User Interface Design for E-Learning Platform and Institutional Portal of University of Foggia. In: Pierpaolo Limone, Raffaele Di Fuccio. Proceedings of the 2nd Workshop on Technology Enhanced Learning Environments for Blended Education, Foggia, Italy, 5-6 October 2021. Smarted.srl: Naples, Italy.
- Clara, C., Jayadi, U. (2022). Analysis of Performance Quality of Administrative Employees at Center for The Development of Quality Assurance of Vocational Education in Building and Electricity Field. *International Journal of Social Science, Education, Communication and Economics*, 1(1), 25-32.
- Hartadi, Made Gana., I Wayan Swandi, I Wayan Mudra. (2020). Colors and Principles of User Interface (UI) Design in Bukaloka Mobile Applications. *Dimensions*, 5(1).
- Lowdermilk, Travis. 2013. *User-centered Design a Developer's Guide to Building User Friendly Applications*. Cambridge: O'Reilly. p.15.
- Pradana, D. et al. (2020). Nasionalism: Character Education Orientation in Learning Development. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal)*. P. 4026-4034
- Rochmawati, I. (2019). Iwearup.com User Interface Analysis. *Visualita Online Journal of Visual Communication Design*, 7(2), 31-44.
- Schrepp, Martin. (2020). *User Experience Questionnaire Plus (UEQ+) Handbook Ver. 2*.
- Sugiyono. (2019). *Qualitative Research Methods and R&D*. Bandung: Alfabeta. p.143.
- Sugiyono. (2021). *Statistics for Research*. Bandung: Alfabeta. p.373.
- Tidwell, Jennifer., Charles Brewer, Aynne Valencia. (2020). *Designing Interfaces Patterns for Effective Interaction Design 3rd Edition*. California: O'Reilly.
- Usman, Husaini., Darmono. (2016). *Future Vocational Education*. Yogyakarta: Research and Development Ministry of Education and Culture. p.16.
- Webster, Merriam. Definition of user friendly. (2022). URLs: <https://www.merriam-webster.com/dictionary/user-friendly>, accessed on March 26, 2022 at 10:37 WIB.