Evaluating UI in Digital Skills Training: Human Centered-Design approach from UI Sanbercode Bootcamp

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Abstract. Sanbercode is a digital skill training program, which can be studied by various classes of training. In the Covid-19 pandemic, much is felt: health, economics, to learning activities. These conditions require learning activities to be carried out at home. The purpose of this training is to enhance a person’s digital abilities or digital skills. Sanbercode training is done online on the web that is easy to access, it is hoped can take place more interactive, real, and fun. The approach applied to UI involves human centered-design. Found eight issues on the features consistent with human centered-design and conducted heuristic evaluations by evaluators. The results show a decline in the number following improvement solutions.

1. Introduction
A Person needs knowledge as a provision for himself to know the wide world and have reliable abilities. Technological developments are apparent in today’s life. In general, learning activities are carried out at schools, universities, seminars, and others that require face-to-face contact. However, these learning activities have changed since the COVID-19 pandemic. The COVID-19 pandemic is a global health crisis that affects all sectors [1], especially teaching and learning activities. Some countries have regulations for out-of-house reduction to avoid the spread of the virus. So, the education sector to several can be done online and at home. Learning activities are realized and can be affectively automated.

Indonesia’s IT industry is moving to develop online learning. Sanbercode Bootcamp is a training program for people who want to increase their IT skills. There are programming training, data science, web app development, UI/UX design, graphic design, and other promising programs in IT. The learning system at Sanbercode Bootcamp uses web applications, zoom meetings, and discussion rooms with experienced trainers and other participants [2]. This digital skills training has a fun learning space, with material facilities, daily assignments, weekly quizzes, and final projects.

Human-centered design becomes an important reference to assess how successful a technology development and system design is. System designed using human-centered methods improve quality by: (1) increasing the productivity of user and the operational efficiency of organizations, (2) being easier to understand and use, thus reducing training and support cost, (3) increasing usability for people with a wider range of capabilities and thus increasing accessibility, (4) improving user experience, (5) reducing discomfort and stress, (6) providing a competitive advantage, (7) contributing towards sustainability objectives [3]. In this context, there are findings of deficiencies in the Sanbercode web
such as the layout of the menu that has a lot of free space, the size of the menu select category is too small, and the display of the active page is not clear. Thus, identification of specific problems is carried out to be used as an evaluation based on the findings of the User [4]. The application of human centered-design is implemented properly to improve the quality of this web application. The most appropriate for analyzing tasks run on form sections of the website, it can judge the usability and function of the user interface. Ten rules in heuristic evaluation (1) Visibility of system status, (2) Match between system and the real world, (3) User control and freedom, (4) Consistency and standards, (5) Error prevention, (6) Recognition rather than recall, (7) Flexibility and efficiency of use, (8) Aesthetic and minimalist design, (9) Help and user recognize, diagnose, and recover from errors, (10) Help and documentation [5]. The evaluation carried out is expected to improve the appearance of the Sanbercode Bootcamp web application and be comfortable to use for this digital skill training.

2. Methods
This section contains an explanation of the methodology used in evaluating the User Interface in Sanbercode Bootcamp.

Figure 1. A Methodology of UI Evaluations

2.1. Analysis of Literature Study
The process of analyzing to find research needs such as a literature study, problem finding, design. The stage of collecting a deep knowledge so that the problem-finding process will be seen and strengthen the research carried out [6].

2.2. Usability Context Specifications
After the analysis has been found, the next step is to identify the usability context specification carried out by stakeholders and user. Usability context specification will found the activities of the needs, characteristics, and environment of the system. Sanbercode web will be dissected carefully so that a deficiency can be found.

2.3. Initial Design Evaluation with Heuristic Evaluation
The third stage is an initial design heuristic evaluation which is an evaluation that will be carried out on this Sanbercode web. Two evaluators have UI background and experience. So that it can obtain heuristic findings that can overcome improvements.
2.4. **User Requirements Specifications**
The next step is done requirement specification, namely processing the data from the evaluation so that it is fulfilled user needs, so that developers can design appropriate repair. Repair design using Figma application. This facilitates communication by allowing requirements from users’ language, we follow the “what you needs” approach[7].

2.5. **Create Design Solutions**
Solution design refers to the wireframe display and improved interface. Keep using the Figma app to make design improvements. Furthermore, the stakeholders are checking the solution and the suitability of the repair.

2.6. **Solution Design Evaluations**
The design solution evaluation stage refers to the heuristic evaluation principle. The evaluation aims to assess and provide suggestions contained in the initial design. So, the Sanbercode web is perfect than the previous design.

2.7. **Comparative Analysis of Initial Design Evaluation Results and Solution Design**
Re-evaluation is carried out at this stage to find a comparison between initial design evaluation and solution design.

2.8. **Conclusion**
The conclusion is the final stage used to answer the problems in this study. Furthermore, the suggestions can be used for further research if this research has shortcomings. Re-evaluation is carried out at this stage to find a comparison between initial design evaluation and solution design.

3. **Analysis Results**

3.1. **Usability Contexts Specification Results**
This process is interviewing the participants of the Sanbercode digital skills training. Users want clarity of system flow. The implementation hours are well listed, the material easily accessible, and career and affiliation registrations have been provided by the organizer.

3.2. **User Requirement Specification Results**
According to the heuristic evaluation, the rules for the category H1 (Visibility of System Status) found a problem where the affiliate program status was always active, the word "new" did not disappear. Look at the figure 2.

![Figure 2 Affiliate Menu (NEW)](image)

Figure 3 in work status, the assignment status has two confusing pieces of information, and it's related to the interface. The status area has followed and the quiz recap button. It doesn't look like a typical status the layout, and in one column.
Furthermore, in the H2 (Match between System and The Real World) category of inconsistent use of language, there are two languages, Indonesian and English. Look at the figure 4.

![Figure 3 Work Status](image)

**Figure 3** Work Status

In the H6 (Recognition Rather Than Recall) category, there is no difference in the color of the active and inactive buttons. Look at the figure 5.

![Figure 4 Language Clarity](image)

**Figure 4** Language Clarity

In the H8 (Aesthetic and Minimalist Design) category, the display has a lot of free space, although the size of the text is good enough to be read by the user, there is a space still used. Example: the main Sanbercode web page (www.sanbercode.com).

### 3.3. Design Solutions

The design solution is made for improvements according to the user needs analysis, where some have yet to match.

![Figure 6 Affiliate Menu View Solution](image)

**Figure 6** Affiliate Menu View Solution
Figure 6. A Comparison is how of initial and new design prototypes for affiliate menu buttons. Previously when the button clicked, the word "new" was still listed even though clicked several times, then the solution was to delete the word "new" when one click and so on was no word "new". To avoid confusion of users on the information button that this information is new or not.

Figure 7 Quiz Recap Display Solution

Figure 7. The solution designed is for the location of the Quiz Recap buttons. Previously this button was located in one column with the work status section. Place the split button with other rows. So you can see the difference between the text and the button.

Figure 8 Profile Management Menu Solutions

Figure 8. Language improvement solutions to remain consistent according to heuristic guidelines, namely in the H2 (Match between System and The Real World) category. Other inconsistent words are also applied, this is better to use one language.

Figure 9 Active Menu Solution

Figure 9. The active tab is visible made it easier for users to know which part of the page is currently operating. The marked with a different color from the bars next to it.
Figure 10. The size of the main menu page section looks well, and there is not much free space. The size of the main button is reasonable than before, so users know that the buttons menu is significant and visible.

3.4. Comparative Analysis of Initial Design Evaluation Results and Solution Design

The following is the number of findings by two evaluators to assess the problems found on the Sanbercode web.

Table 1. Total of problems found in Initial Heuristic Evaluations.

| Heuristic Evaluation | Evaluator 1 | Evaluator 2 | Total |
|----------------------|-------------|-------------|-------|
| H1                   | 0           | 2           | 2     |
| H2                   | 1           | 1           | 2     |
| H3                   | 0           | 0           | 0     |
| H4                   | 0           | 0           | 0     |
| H5                   | 0           | 0           | 0     |
| H6                   | 1           | 1           | 2     |
| H7                   | 0           | 0           | 0     |
| H8                   | 1           | 1           | 2     |
| H9                   | 0           | 0           | 0     |
| H10                  | 0           | 0           | 0     |
| **Total**            | **3**       | **5**       | **8** |

Based on Table 1. It can be seen that the average score entered in either category. There are 8 (eight) problems found by the two evaluators.

This study examines a small part of Web Sanbercode, namely the main menu in general. Human centered-design reference is even wider so that UI design can be even better, and heuristic evaluation is one of the right tests. The findings made, there are at least eight problems that exist on the web. Followed by a Human centered-design approach and heuristic evaluation. The categories found are:

- H1 (Visibility of System Status) shows the notification of the status of the "new" affiliate button that does not disappear when it has been more than one visit (click), and there is a placement of work status still joined to the quiz recap button. Then after being given a solution design, the evaluator assesses that there is 1 (one) problem that still arises, namely the placement of the colored new affiliate icon.
- There are two problems that arise by evaluators that have been assessed in H2 (Match between System and The Real World), the use of language that is more appropriate to use one language. And the placement of the writing is not parallel.
- H6 (Recognition Rather Than Recall) category has two problems. there is no difference in the color of the active and inactive buttons. So, Reduced design solutions with one fix.
• The interface is no problem found in the H8 category (Aesthetic and Minimalist Design) after the final evaluation by the evaluator.

Table 2. Number of Findings on Solution Design

| Heuristic Evaluation | Evaluator 1 | Evaluator 2 | Total |
|----------------------|------------|------------|-------|
| H1                   | 0          | 1          | 1     |
| H2                   | 0          | 0          | 0     |
| H3                   | 0          | 0          | 0     |
| H4                   | 0          | 0          | 0     |
| H5                   | 0          | 0          | 0     |
| H6                   | 1          | 0          | 1     |
| H7                   | 0          | 0          | 0     |
| H8                   | 0          | 0          | 0     |
| H9                   | 0          | 0          | 0     |
| H10                  | 0          | 0          | 0     |
| Total                | 1          | 1          | 2     |

4. Conclusion
Sanbercode Bootcamp is the driver and organizer of Indonesia Mengoding which facilitates users to learn digital skills. Characteristics of the world of work and the qualifications of labor that the industry needs in the industrial era 4.0 are changing rapidly[8]. Participants are provided with knowledge for the future. Training programs ranging from design to programming have grade levels: Basic Class, Project Class, and Partner Class. Many of the boot camp participants who took part in this program still put forward a review of the results of the Sanbercode Bootcamp. The design of the design solution resulted in improvement and reduction of the problem that was resolved after a heuristic evaluation according to human centered-design method was carried out. There are many aspects of the user experience that can be taken into consideration when designing interactive products. What matters most is utility, functionality, aesthetics, content, look and feel, as well as sensual and emotional appeal [9]. With this research, it is hoped that there will be improvements by the Sanbercode team so that they pay more attention to details to facilitate members, can pay attention to the user interface, and have a better user experience.

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