*Journal of Applied Engineering and Technological Science*
Vol 3(2) 2022 : 178-184

# *USABILITY TESTING ON TRACER STUDY SYSTEM USING THE HEURISTIC EVALUATION METHOD*

**Afriansyah[1*], Walhidayat[2], Rizki Novendra[3], Lidwina Harefa[4], Sutejo[5]**
[12345]Universitas Lancang Kuning
afriansyah@unilak.ac.id

Received : 25 May 2022, Revised: 29 June 2022, Accepted : 30 June 2022
**Corresponding Author*

***ABSTRACT***
*A tracer study is a survey of graduates tracks alumni activities after graduating from an educational institution, Lancang Kuning University is one of the educational institutions that have a tracer study system. A system can be said to be good if it has good usability. So the purpose of this research is to find out whether the tracer study system of Universitas Lancang Kuning has good usability. The heuristic evaluation method will be used to measure usability using 10 aspects of usability heuristics with a questionnaire media in collecting data. Before distributing the questionnaires, an instrument test such as the Gregory test will be carried out by involving system experts and linguists. Then a validity test will be carried out, a reliability test will be carried out after that a heuristic test is carried out by distributing questionnaires. Based on the calculation results that the lowest percentage is owned by the visibility of the system status variable by 75% and the highest percentage results in the match between the system and the real world and consistency and standard with the same calculation results obtained by 81%. The results of the analysis show that the tracer system of Universitas Lancang Kuning has high usability with an average percentage of 78%.*
***Keywords :*** *Usability, Heuristic Evaluation, Tracer Study*

## 1. Introduction

The usability test of a web is something that needs to be considered by software developers to create an attractive and user-friendly interface design to make it easier for all users(Hartstein, et al., 2022). Usability testing is one way to find out how easy it is for users to use an application, how efficiently and effectively an application or website can help users achieve their goals, and whether users are satisfied with the application used(Merve Demirci, 2021; Anderjovi, et al., 2022). Usability is centered on the attributes of a system and efforts to avoid errors or usability problems(Beatty, et al., 2021). While the focus of UX is on the user and the user's good response to the system can be seen from the emotions, behavior, and values resulting from the interaction of the system with the system. Lancang Kuning University is a private university in Pekanbaru that already has a system, one of which is a tracer study system that is already running, which will be filled in by alumni themselves(Dilan, et al., 2022; Chrismanto, et al., 2021; Hamzah, et al., 2021).

The tracer study service system in P2K2 can achieve specific goals effectively, efficiently, and achieve user satisfaction, so a usability evaluation is needed, one of which is using the Heuristic Evaluation method(Langevin, et al., 2021). Heuristic evaluation is a usability evaluation method whose aim is to improve a design effectively by using 10 aspects of usability heuristics. This method allows evaluators who can independently evaluate and assess the system from every aspect of usability heuristics that indicate usability problems in a system. This study aims to determine the usability level of the Universitas Lancang Kuning tracer study system using the Heuristic Evaluation method(Alcaraz Martínez, et al., 2021; Hamzah, et al., 2022).

Tracer Study is an approach that allows higher education institutions to obtain information about deficiencies that may occur in the educational process and the learning process and can be the basis for planning activities for future improvements. The specific objectives of the tracer study include knowing the relevance of implementing the curriculum that has been applied in universities to the needs of the labor market and professional development in the competence of the department(Klarich, et al., 2022).

Usability testing is a technique used to evaluate products by testing them directly on users, usability testing is an attribute to assess how easy the website interface is to use (Rocha, 2021; Khairani, et al., 2022). Based on this statement, it's can be concluded that usability is a tool used to measure efficiency, ease, and ability to remember interactions without problems or errors. Experts in the usability field state that usability consists of two main things, namely are ease of learning and ease use(Jácome Filho & Macêdo, 2022).

Heuristic Evaluation is one of the methods commonly used to perform usability testing. Nielsen's opinion states that this method is commonly used to find usability problems in user interface design finding usability problems in interface design this method can be included as part of the interactive design process (Bouraghi, et al., 2022; Bauer-Negrini, et al., 2022).

## 2. Research Methods

The method used is the Heuristic evaluation method using 10 aspects of usability in the measurement scale:

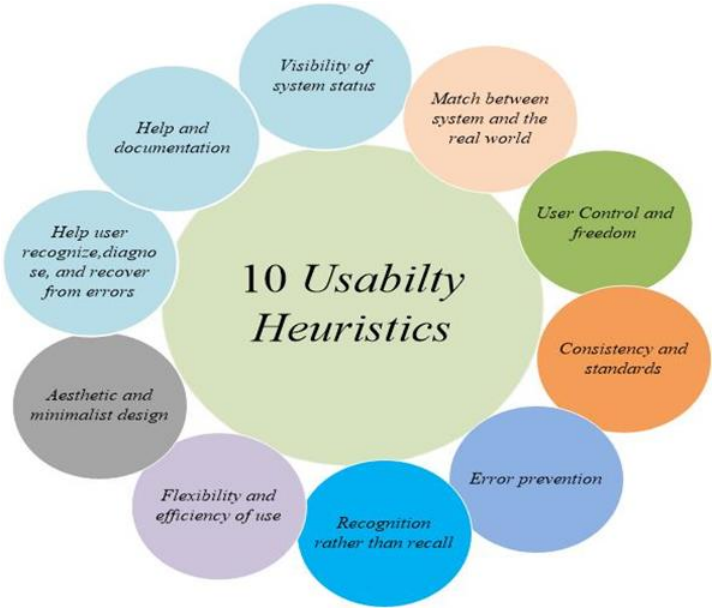


Fig. 1. Usability Heuristic

## 3. Results

This study collected answers from 15 respondents using a Likert scale consisting of strongly agree (SS), agree (S), neutral (N), disagree (TS), and strongly disagree (STS). Each variable is calculated using the statistical formula percentage.

### 3.1. Heuristic Test Result

Based on Figure 3, it can be seen the results of calculating the average percentage of each variable in the heuristic evaluation method with the highest percentage value being in the match between system and real-world (H2) variable with a value of 81.33% and the lowest percentage being in the visibility of system status variable ( H3) with a value of 75.33%.

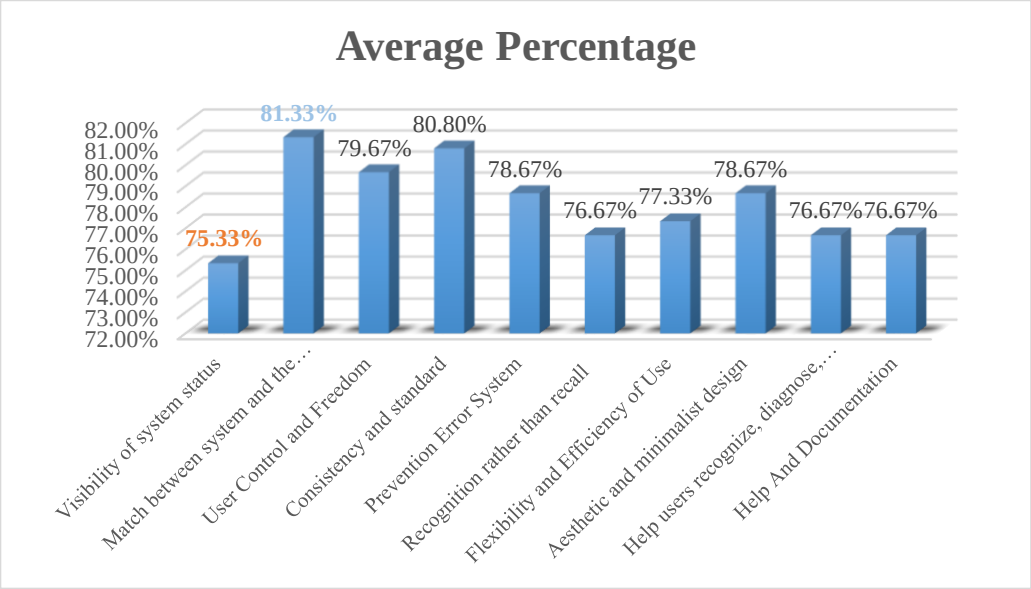


Fig. 2. Percentage of Heuristic Test Results

### 3.2. Instrument Trial Results

3.2.1 Gregory Test Results

The calculation of the validity test of an instrument was completed using the Gregory formula which involved 2 experts (Geisen & Romano Bergstrom, 2017). The results of calculations involving 2 experts, namely linguists and systems experts, the results of the content validity coefficient of the instrument being tested was 0.97. So it can be concluded that this instrument meets the criteria for hearing very high validity.

3.2.2 Validity Test Results

The construct validity test used the Pearson product Moment correlation formula. Instrument testing uses a sample of 15 respondents with an r table value of 0.514. The instrument items tested were 32 items, one statement was declared invalid (eliminated immediately) and 31 items were declared valid. Calculation results using Microsoft Excel 2013 and the IBM SPSS Statistics 25 application.

3.2.3 Reliability Test Results

A reliability test is used to test whether the instrument used is reliable. Strong if there is a similarity of information at various times. The test calculation uses the IBM SPSS Statistic 25 application. From the results of the reliability calculation using the Alpha Cronbach formula, namely 0.971> 0.6, it can be concluded that the statements used in the questionnaire are reliable, which means that there are similarities in the data at different times and the following data is accurate

3.2.4 Recommendations

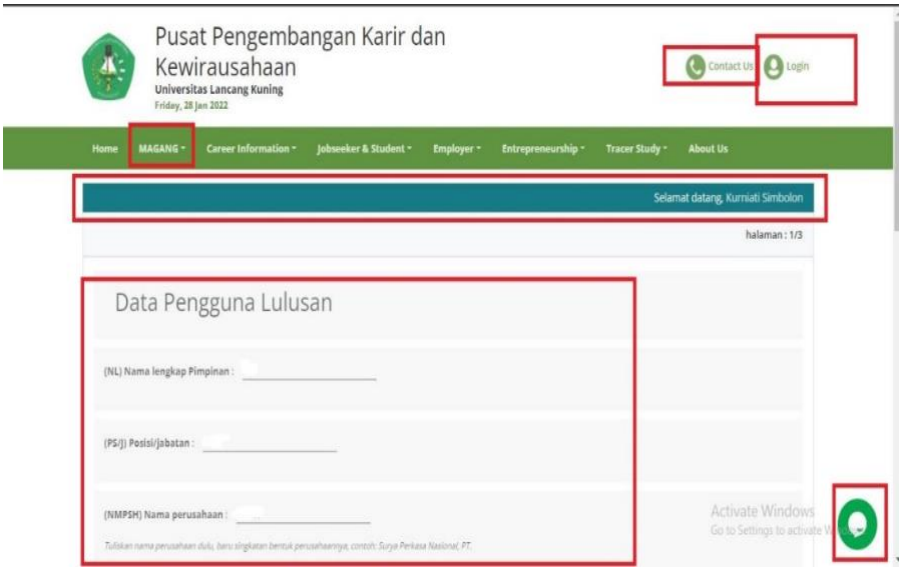


Fig. 3. Instrument Menu Page (1)

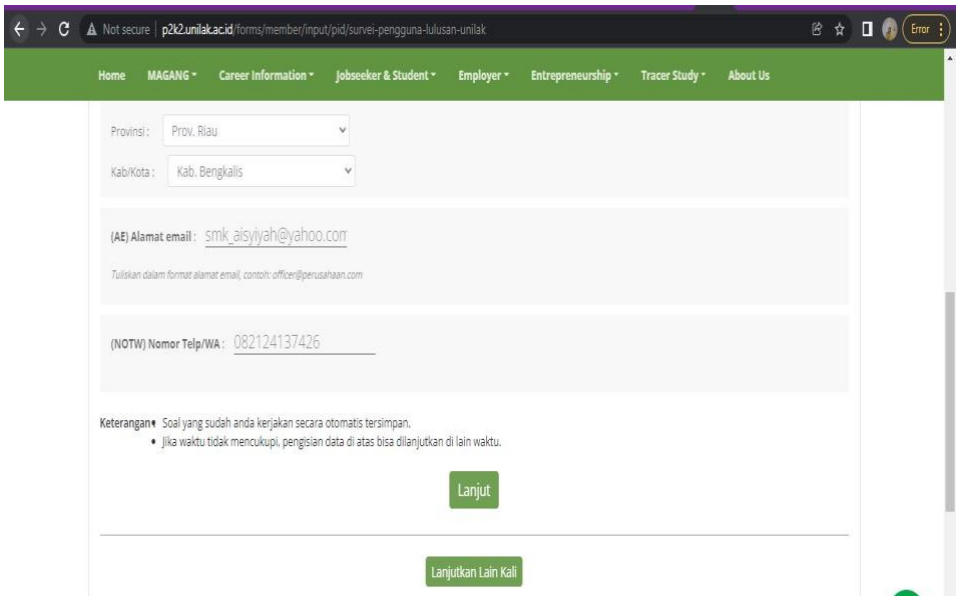


Fig. 4. Instrument Menu Page (2)

Based on Figures 3 and 4 the draft recommendations. The improvements made are as follows :

a) Consistency in letters/words such as the word "MAGANG" into Capitalize Each Word format refers to heuristic number 4, namely consistency and standard on statement item number 14 based on the questionnaire results obtained on this item 4 respondents chose strongly agree, 10 respondents chose to agree and 3 respondents neutral answer.
b) Remove the word “selamat datang” on the upper right side of the instrument fill page. The use of the word "selamat datang" on the instrument filling page is considered unsuitable because in general the word "selamat datang" refers to someone who has just entered the system usually located on the web prefix after logging in, referring to the heuristic number 2 in statement item number 6. Based on the results questionnaire 3 respondents chose neutral on statement number 6.

c) The next recommendation is to eliminate foreign symbols or symbols that are considered unfamiliar or do not understand the meaning which is located on the lower right corner as a telephone symbol, with reference to heuristic number 2 in statement item number 4.
d) Adding or providing a user manual menu so that users can access the system properly refers to heuristic number 9, namely help users recognize, diagnose, and recover from error question number 30.
e) Remove the login icon or link to log in. The existence of redundant buttons on login after alumni enter the Unilak tracer study page menu has the potential to cause users to be confused. Based on the book Research-Based Web Design & Usability Guidelines which states not to provide two or more ways with the same information on one web page. Therefore, the researcher changed the information on the user login icon to an icon with alumni information that had logged in as alumni.
f) Changing the font color with a darker color, when compared to the previous color, the gray font on the instrument filling form is closer to gray so that the font is not very visible and legible. This recommendation is based on a rule from the book Research-Based Web Design & Usability Guidelines, which is that people will read dark text 32% faster than reading light text.

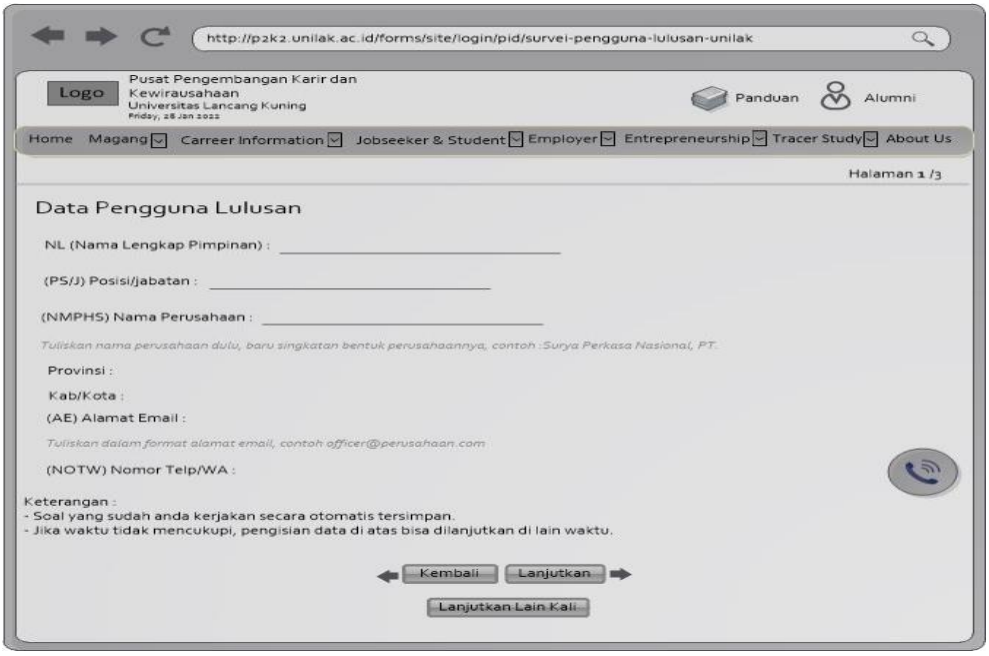


Fig. 5. Result of Recommendation for Improvement of Instrument Menu (1,2)

## 4. Conclusion

Based on the results and discussion, it can be concluded that the results of the analysis of the tracer study system at Lancang Kuning University using 10 aspects of usability variables obtained from 15 respondents with 31 research questionnaire statements obtained an average percentage, namely Visibility of system status 75%, Match between system and the real world 81%, User Control and Freedom 80%, Consistency and standard 81%, Prevention System Error 79%, Recognition rather than recall 77%, Flexibility, and Efficiency of Use 77%, Aesthetic and minimalist design 79%, Help users recognize, diagnose, and recover from error 77%, and Help And Documentation 77%. From this statement, the average usability percentage is 78% in the high category.

**References**

Alcaraz Martínez, R., Turró, M. R., & Granollers Saltiveri, T. (2021). Methodology for heuristic evaluation of the accessibility of statistical charts for people with low vision and color vision deficiency. *Universal access in the information society*, 1-32.

Alshaheen, R., & Tang, R. (2022). User Experience and Information Architecture of Selected National Library Websites: A Comparative Content Inventory, Heuristic Evaluation, and Usability Investigation. *Journal of Web Librarianship, 16*(1), 31-67.

Anderjovi, S., Hamzah, M. L., Maita, I., & Ahsyar, T. H. (2022). User Satisfaction Analysis of E-Learning Using End User Computing Satisfaction in Covid 19. In *Proceedings of the 4th African International Conference on Industrial Engineering and Operations Management Nsukka, Nigeria*, April 5-7, 2022.

Bauer-Negrini, G., da Fonseca, G. C., Gottfried, C., & Herbert, J. (2022). Usability evaluation of circRNA identification tools: Development of a heuristic-based framework and analysis. *Computers in Biology and Medicine*, 105785.

Beatty, L., Koczwara, B., Butow, P., Turner, J., Girgis, A., Schofield, P., ... & Kemp, E. (2021). Development and usability testing of a web-based psychosocial intervention for women living with metastatic breast cancer: Finding My Way-Advanced. *Journal of Cancer Survivorship, 15*(3), 403-409.

Bouraghi, H., Rezayi, S., Amirazodi, S., Nabovati, E., & Saeedi, S. (2022). Evaluating the usability of a national health information system with heuristic method. *Journal of Education and Health Promotion, 11*(1), 182.

Chrismanto, A. R., Purwadi, J., Wibowo, A., Santoso, H. B., Delima, R., & Balisa, D. (2021). Comparison Testing Functional and Usability System Mapping Land Agriculture On Platform Web and Mobile. *IAIC Transactions on Sustainable Digital Innovation (ITSDI), 2*(2), 140-157.

Dilan, R., Gali, M. A., & Llavore, D. (2022, February). Usability Test of Moodle LMS Using Empirical Data and Questionnaire for User Interface Satisfaction. In *2022 11th International Conference on Software and Computer Applications* (pp. 29-40).

Hamzah, M. L., Rizal, F., & Simatupang, W. (2021). Development of Augmented Reality Application for Learning Computer Network Device. *International Journal of Interactive Mobile Technologies, 15*(12).

Hamzah., Tambak, S., Hamzah, M. L., Purwati, A. A., Irawan, Y., & Umam, M. I. H. (2022). Effectiveness of blended learning model based on problem-based learning in Islamic studies course. *International Journal of Instruction, 15*(2), 775-792. https://doi.org/10.29333/iji.2022.15242a

Hartstein, A. J., Verkuyl, M., Zimney, K., Yockey, J., & Berg-Poppe, P. (2022). Virtual Reality Instructional Design in Orthopedic Physical Therapy Education: A Mixed-Methods Usability Test. *Simulation & Gaming, 53*(2), 111-134.

Jácome Filho, E. D. A., & Macêdo, J. M. A. (2022). Analysis of Responsiveness and Usability in Websites Serving Public Transparency in a Mobile Environment: Case Study in the State of Paraíba Through Heuristic Evaluation. In *International Conference on Human-Computer Interaction* (pp. 106-127). Springer, Cham.

Khairani, P., Hamzah, M. L., Megawati, M., & Jazman, M. (2022). Evaluasi Kinerja Sistem Informasi Elektronik Kinerja ASN (SI-EKA) Menggunakan Framework Cobit 5 Pada Kementerian Agama Kota Pekanbaru. *INTECOMS: Journal of Information Technology and Computer Science, 5*(1), 8-18. https://doi.org/https://doi.org/10.31539/intecoms.v5i1.3693

Klarich, A., Noonan, T. Z., Reichlen, C., St Marie, J. B., Cullen, L., & Pennathur, P. R. (2022). Usability of smart infusion pumps: A heuristic evaluation. *Applied ergonomics*, 98, 103584.

Langevin, R., Lordon, R. J., Avrahami, T., Cowan, B. R., Hirsch, T., & Hsieh, G. (2021, May). Heuristic evaluation of conversational agents. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems* (pp. 1-15).

Merve Demirci, H. (2021, July). Online Shopping Web Sites' Perceived Usability: A Case Study with Turkish Shopping Related Web Sites. In *International Conference on Applied Human Factors and Ergonomics* (pp. 759-766). Springer, Cham.

Rocha, N. P. (2021). Heuristic Evaluation of the Usability of Smart Home Applications. *Comprehensible Science: ICCS 2021, 315*, 483.

Sudarmilah, E., Saputra, D. B., Arbain, A. F. B., & Murtiyasa, B. (2021, May). Web-Based System for Growth and Development Monitoring Early Childhood. In *Journal of Physics: Conference Series* (Vol. 1874, No. 1, p. 012024). IOP Publishing.