International Journal of Computer and Information System (IJCIS)
Peer Reviewed - International Journal
Vol : Vol. 06, Issue 03, July 2025
e-ISSN : 2745-9659
https://ijcis.net/index.php/ijcis/index

The Impact of Website Interactivity on Users' Speed in Finding Information: Evidence from Five Top-Ranked Indonesian Universities

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Abstract— *University websites serve as primary sources of information for prospective students and the general public. This study aims to examine the relationship between website interactivity and the efficiency of information retrieval at five of the top ten Indonesian universities according to the QS World University Rankings 2025: ITB, UGM, IPB, ITS, and UI. A total of 30 participants from various universities in Surabaya were asked to complete three types of information search tasks on two different university websites. The time taken to complete each task was recorded using a stopwatch. After completing the tasks, participants completed a questionnaire evaluating their perceptions of the websites' interactivity and ease of use. A Two-Way ANOVA revealed significant effects of university website, task type, and their interaction on task completion time. The findings highlight the crucial role of website structure and interactivity in enhancing users' efficiency when searching for information. A significant interaction effect was found between website interactivity and task completion time ($F = 4.395$, $p < .05$).*

Keywords : *Human Computer Interaction, UI/UX Website, Webisite Interactivity Test, ANOVA*

I. INTRODUCTION

Human-Computer Interaction (HCI) is the study of how humans interact with computers, focusing on the design and evaluation of user interfaces and technologies in both practical and academic contexts. In HCI, humans provide input to computers—such as typing on a keyboard, clicking a button, or using touchscreen gestures—and receive output in the form of feedback, enabling two-way interaction. Newer technologies like virtual reality (VR), augmented reality (AR), and mixed reality (MR) have further expanded the ways users interact with digital systems.

These interactions form the foundation of User Experience (UX), which refers to users' overall perceptions, emotions, and satisfaction when engaging with a digital product or system. A well-designed user experience aims to make these interactions efficient, intuitive, and enjoyable.

An important aspect of user experience is the interactivity of university websites, which can influence how quickly users are able to find information. For example, a well-designed website can help prospective students or parents easily access essential information such as the admission process, the list of faculties or departments, available scholarships for underprivileged students, and extracurricular activities offered by the university.

In previous studies, website interactivity has been shown to influence user preferences [1]. User preferences are part of the overall user experience and can vary from person to person. These preferences can affect users' ability to find information efficiently [2]. The efficiency of web browsing influences how long a user spends searching for information. It can be inconvenient and frustrating if users take too long to locate what they need. The efficiency of web browsing depends on how well a website is structured [3]. A well-structured website allows users to find information more quickly. However, the specific effect of website interactivity on the speed of finding information remains underexplored.

Website interactivity is an important component that can be implemented in various ways, depending on the website's specific goals [4]. Interactivity has been proven to influence user preferences [1]. Because the implementation of interactivity differs across websites, user preferences also vary. Perceived website interactivity is associated with factors such as efficiency, enjoyment, trust, and loyalty [5]. Efficiency refers to the ability to perform tasks properly and accurately, without wasting time, effort, or resources. As noted earlier, the efficiency of web browsing depends on how well a website is structured [3]. In this study, the efficiency of interactive websites is the main focus.

Previous studies investigating the effect of website design on user preferences have shown that users respond more positively to websites with higher interactivity and tend to prefer more interactive sites [6]. Research [3] conducted two experimental studies to examine how users evaluated interface designs

commonly used on mobile news websites. They found that homepage structures and mobile page designs had a significant impact on perceived ease of use, reading time, and the overall reading experience.

In the digital age, university websites function not only as information portals but also as the primary gateways through which prospective students, parents, and the academic community access institutional services. As expectations for fast and seamless information access continue to rise, the role of website interactivity becomes increasingly critical. A website that is difficult to navigate or lacks responsive features may hinder users from efficiently retrieving the information they need, leading to frustration and potentially undermining the institution's credibility. Therefore, understanding how interactivity influences user behavior—particularly in terms of the time required to locate specific information—is essential for enhancing user satisfaction and ensuring effective digital communication within the higher education sector.

In light of the issues discussed above, this study investigated the effect of website interactivity at five of the top ten Indonesian universities, as ranked by the QS World University Rankings 2025 [7], on user experience and the speed of retrieving information.

This paper is organized into the following sections: the **Research Methods** section describes the participants involved in the study, including their age range and backgrounds, as well as the data collection process and experimental procedures. **The Results and Analysis** section presents the findings related to task completion speed across the five university websites, focusing on quantitative outcomes. Finally, the Conclusion section provides a summary of key results and implications for website design in the higher education sector.

II. RESEARCH METHODS

This study employed a quantitative approach to test website interactivity, involving 30 participants. All participants were university students in Surabaya, representing various educational levels. The group consisted of 22 men and 8 women, aged between 18 and 30 years. All participants were familiar with searching for information online but had never accessed the websites of any of the universities included in this study.

2.1 UI/UX Interaction Testing

This study compares the websites of the top ten Indonesian universities, based on the QS World University Rankings (see Figures 1–5). From these ten universities, five were selected for website interactivity testing. The selected universities are Institut Teknologi Bandung (ITB), Universitas Gadjah Mada (UGM), Institut Pertanian Bogor (IPB), Institut Teknologi Sepuluh Nopember (ITS), and Universitas Indonesia (UI).

Figure 1. ITB homepage (source: https://www.ITB.ac.id/).

Figure 2. UGM homepage (source: https://www.UGM.ac.id/).

Figure 3. IPB homepage (source: https://www.ipb.ac.id/).

Figure 4. ITS homepage (source: https://www.its.ac.id/).

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Figure 5. UI homepage (source: https://www.UI.ac.id/).

At the beginning of the study, we developed a testing procedure to be used with the participants. The procedure, illustrated in Figure 6, is described below.

1. The study was introduced to several participants, and those who expressed interest were invited to participate.
2. Participants were asked to sit or position themselves comfortably before beginning the task.
3. Each participant was instructed to complete a personal data form.
4. A browser application commonly used by each participant was opened to carry out the task.
5. Participants were directed to access the websites of two different universities.
6. The task instructions were explained, including that participants were allowed to use any available language and features on the website.
7. Participants performed the tasks while their completion time was measured using a stopwatch and recorded in a spreadsheet.
8. Upon completing the tasks, participants filled out a questionnaire regarding the interactivity, responsiveness, and ease of use of the websites.
9. As a token of appreciation, participants were given lollipops for their involvement in the study.

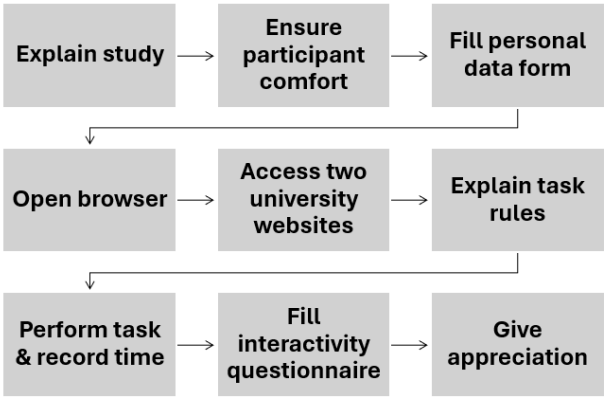

Figure 6. Flowchart Testing Procedure

In this study, participants were tasked with finding specific information on various university websites. Three tasks were assigned for each website, and every participant was required to complete all three. These tasks included: locating information about undergraduate admissions, identifying the list of faculties, and finding the name of the current university rector.

A between-subjects design was employed, wherein each participant was assigned to one or more conditions to ensure that they were only exposed to a specific user interface or a limited set of interfaces. This study investigates the effect of website interactivity on the time it takes users to find information—essentially, how efficiently website design supports the user experience. The five university websites selected are known to exhibit varying degrees of interactivity, making them suitable for comparative analysis. Based on these differences, this study hypothesizes that higher levels of website interactivity will have a significant influence on users' speed and efficiency in retrieving information.

2.2 Two-Way ANOVA

Two-Way ANOVA is a statistical method used to assess the impact of two independent categorical variables (factors) on one continuous dependent variable, including whether an interaction effect exists between the two factors [8].

This method tests:

- Main effect of Factor A
- Main effect of Factor B
- Interaction effect between A and B

To examine the effect of website interactivity on users' speed in finding information, a two-way Analysis of Variance (ANOVA) was employed. This statistical method was selected to analyze the impact of two independent variables—namely, the university website (with five levels: ITB, UGM, IPB, ITS, and UI) and the type of task (with three levels: task 1, task 2, and task 3)—on the dependent variable, which was the time (in seconds) required to complete each information search task.

The two-way ANOVA model (1) used in this study is expressed as:

$$Y_{ijk=}\mu+\alpha_i+\beta_j+(\alpha\beta)_{ij}+\varepsilon_{ijk} \quad (1)$$

Where :

Y_{ijk} : the observed time taken by participant k under university i and task j,
μ : the overall mean time across all groups,
α_i : the effect of the i^{th} university website,
β_j : the effect of the j^{th} task type,
$(\alpha\beta)_{ij}$: the interaction effect between university and task,
ε_{ijk} : the random error term.

III. RESULT AND ANALYSIS

3.1 Between-subjects

A between-subjects design was employed in this study, in which each participant was tested under specific conditions and exposed to only one or a limited number of website interfaces. This design was chosen to minimize potential learning effects or fatigue that might result from repeated exposure to similar tasks across multiple websites. The data collected from participants are summarized in Table 1.

Table 1. Between-subjects factors.

	Value	Label	N
University	1.00	ITB	36
	2.00	UGM	36
	3.00	IPB	36
	4.00	ITS	36
	5.00	UI	36
Task	1.00	T1 (Student Admission Info)	60
	2.00	T2 (List Faculty)	60
	3.00	T3 (University Rector Info)	60

This study employed a between-subjects experimental design to evaluate the impact of website interactivity on user efficiency in finding information. A total of 30 participants, consisting of university students from various institutions in Surabaya, were recruited for the experiment. All participants had experience in browsing websites but had never previously accessed any of the university websites tested in this study. Each participant was assigned to interact with two different university.

Each website was evaluated through three standardized tasks: (1) locating information about new undergraduate student registration, (2) identifying the list of faculties, and (3) finding the name of the current rector. As a result, each participant completed six tasks in total (three tasks per website × two websites). To ensure balanced data distribution and prevent learning effects or fatigue, participants were randomly assigned to website-task combinations. With this configuration, each university website was evaluated by 12 participants, resulting in 36 task observations per university (12 participants × 3 tasks). Additionally, each individual task (Task 1, Task 2, and Task 3) was performed 60 times across all website conditions (30 participants × 2 websites), resulting in a total of 180 observations collected during the study. This design allowed for reliable comparisons across university websites and task types, with the primary goal of examining how website interactivity influences the speed of information retrieval by users.

3.2 Descriptive statistics

Table 2 presents the descriptive statistics summarizing the average task completion times, measured in seconds, for each of the three tasks.

The average completion time for all tasks across all universities (grand mean) was 32.37 seconds, with a standard deviation of 41.44 seconds, indicating a substantial variability in performance depending on the website and task complexity.

Among all universities, Universitas Indonesia (UI) demonstrated the highest overall efficiency, with a mean completion time of 14.53 seconds. All three tasks on the UI website were completed quickly, with the lowest average time observed for Task 2 (M = 8.42 s), suggesting an effective and user-oriented information structure.

Conversely, the website of Institut Teknologi Sepuluh Nopember (ITS) yielded the longest average completion time of 67.00 seconds, with Task 3 requiring an average of 116.50 seconds to complete. This result suggests potential usability issues, such as poor information placement or complex navigation structure.

Institut Pertanian Bogor (IPB) also recorded a relatively high overall mean (M = 37.42 s), with Task 3 again being the most time-consuming (M = 73.00 s). In comparison, ITB and UGM had moderate performance levels, with overall means of 23.11 s and 19.78 s, respectively.

The descriptive findings highlight significant disparities in user efficiency across websites and task types. Both website interactivity and the nature of the information sought appear to affect how quickly users retrieve relevant content.

Table 2. Descriptive Statistics

University	Task	Mean	Std. Deviation	N
ITB	Task1	15.6667	8.54223	12
	Task2	8.7500	7.09834	12
	Task3	44.9167	23.63148	12
	Total	23.1111	21.61055	36
UGM	Task1	25.3333	36.01094	12
	Task2	14.6667	11.17898	12
	Task3	19.3333	11.11374	12
	Total	19.7778	22.47807	36
IPB	Task1	25.9167	15.32946	12
	Task2	13.3333	7.74988	12
	Task3	73.0000	45.48726	12
	Total	37.4167	37.70061	36
ITS	Task1	59.0000	58.96070	12
	Task2	25.5000	46.60570	12
	Task3	116.500	61.52826	12
	Total	67.0000	66.46460	36
UI	Task1	14.7500	11.15286	12

	Task2	8.4167	3.94181	12
	Task3	20.4167	14.13865	12
	Total	14.5278	11.46793	36
Total	Task1	28.1333	35.14159	60
	Task2	14.1333	22.15314	60
	Task3	54.8333	51.12536	60
	Total	32.3667	41.43635	180

Figure 7 illustrates the average task completion time required by participants when searching for information on the websites of five top Indonesian universities. The data clearly indicate variation in performance across different university websites.

Among all universities tested, Universitas Indonesia (UI) had the lowest average task completion time, with participants requiring approximately 14.53 seconds to complete the tasks. This suggests that UI's website offers a more efficient, user-friendly interface that facilitates faster information retrieval.

In contrast, Institut Teknologi Sepuluh Nopember (ITS) recorded the highest average completion time of 67 seconds, indicating possible usability issues, lower interactivity, or less intuitive navigation design compared to the other university websites.

Institut Teknologi Bandung (ITB), Universitas Gadjah Mada (UGM), and Institut Pertanian Bogor (IPB) showed moderate performance, with average times of 23.11, 19.78, and 37.42 seconds, respectively. Although these sites performed better than ITS, they were still slower than UI.

Overall, the graph provides evidence that the design and interactivity level of university websites significantly influence the speed at which users can locate desired information. A well-structured and interactive web interface can lead to faster task performance, supporting the hypothesis of this study.

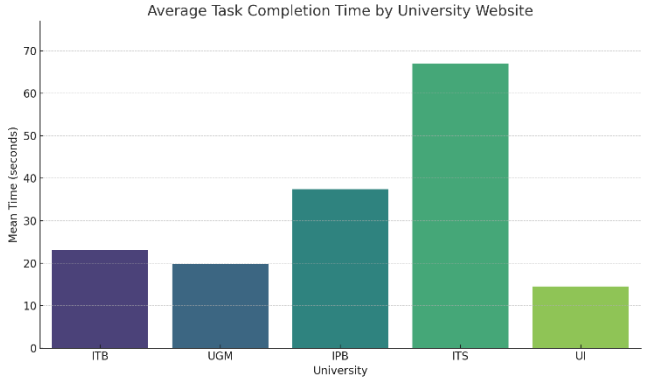

Figure 7. Task Completion Time

3.3 Two-Way ANOVA Results

Two-way ANOVAs were conducted to examine the effect of website interactivity on user performance across the university websites of ITB, UGM, IPB, ITS, and UI (Table 3). The dependent variable was the users' speed in completing information search tasks. As shown in Table 3, there was a significant interaction effect between university website and task on completion time ($F = 4.395$, $p < .05$). This interaction was primarily driven by considerable variations in task completion times among participants during the experimental trials.

The model yielded an R-squared value of 0.486, indicating that approximately 48.6% of the variance in task completion time could be explained by the combined effects of university, task, and their interaction. The adjusted R-squared value of 0.442 further supports the robustness and reliability of the model.

These results highlight that website interactivity significantly influences both user efficiency and satisfaction. Universities with lower average task completion times, such as Universitas Indonesia (UI), demonstrated more effective user-centered web design. In contrast, websites with higher completion times, such as Institut Teknologi Sepuluh Nopember (ITS), may benefit from improvements in information architecture and task-specific usability features to enhance user experience.

Table 3. Tests of between-subjects effect Two Way ANOVA.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	149320.300[a]	14	10665.736	11.137	.000
Intercept	188568.200	1	188568.200	196.901	.000
University	64344.300	4	16086.075	16.797	.000
Task	51307.600	2	25653.800	26.787	.000
University * Task	33668.400	8	4208.550	**4.395**	.000
Error	158017.500	165	957.682		
Total	495906.000	180			
Corrected Total	307337.800	179			

a. R Squared = ,486 (Adjusted R Squared = ,442)

The level of interactivity embedded within each university's website plays a meaningful role in how efficiently users are able to complete information-seeking tasks. Specifically, websites with higher

interactivity and better-structured navigation systems were associated with significantly faster task completion times. Conversely, websites with lower interactivity tended to cause delays and confusion, resulting in longer times spent searching for the required information

The presence of a significant interaction effect suggests that the influence of website interactivity on user performance is not uniform across all task types. In other words, the degree to which interactivity improves performance may vary depending on the complexity or nature of the information being sought. These results highlight the importance of thoughtful web design, especially in academic institutions, where the accessibility and clarity of information are crucial to prospective students, parents, and other stakeholders.

VI. CONCLUSION

This study investigated the impact of website interactivity on users' efficiency in retrieving information across five of the top ten Indonesian universities. Utilizing a between-subjects experimental design and two-way ANOVA analysis, the results demonstrated that both the university website and the type of task had a statistically significant effect on user performance, as measured by task completion time. Moreover, a significant interaction effect was observed between the website and task type, indicating that the usability and efficiency of website interactivity are task-dependent.

Among the tested websites, Universitas Indonesia (UI) consistently yielded the shortest average task completion time, reflecting a well-structured, intuitive, and user-centered interface. Conversely, Institut Teknologi Sepuluh Nopember (ITS) recorded the longest completion times, highlighting potential usability issues and the need for improved information architecture and navigation flow.

These findings underscore the critical role of interactive and well-organized university websites in enhancing user efficiency and overall user experience. As digital platforms increasingly serve as the primary point of contact for prospective students and stakeholders, universities are strongly encouraged to adopt user-centered design principles. Special attention should be given to optimizing the accessibility and clarity of essential information such as admissions procedures, faculty directories, and institutional leadership profiles.

Future research is recommended to expand upon these findings by incorporating additional user variables such as digital literacy, device type, or cognitive load, as well as exploring cross-cultural differences in user interface preferences within higher education digital ecosystems.

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