Eye Tracker Evaluation on Google Classroom Using USE Questionnaire

Atyanti Dyah Prabaswari*, Bagus Wahyu Utomo2, and Hari Purnomo3

1Department of Industrial Engineering, Universitas Islam Indonesia, Indonesia
2Department of Industrial Engineering, Sekolah Tinggi Teknologi Adisutjipto Yogyakarta, Indonesia
3Department of Industrial Engineering, Universitas Islam Indonesia, Indonesia

*Atyanti.dyah@uii.ac.id

Abstract. Eye tracking is an activity of measuring focus or movement of eyesight in viewing web pages. Usability test methods using eye tracker can maximizing usability evaluations. Based on a discussion with eye tracker users that the usage of tools can make discomfort. We need an analysis of the use of eye trackers whether it affects the usability results. Especially the price of the tool is quite expensive. 16 respondents divided by 2 groups, doing the task with the eye tracker and without eye tracker. Then calculate the time for each task, and spread USE questionnaires. The average time of without eye tracker respondents in task 1 = 165 seconds, task 2 = 109.375 seconds and 3 errors occurred in task 2. The average time of respondents using eye tracker on task 1 = 164.75 seconds, task 2 = 83.442 seconds and 1 error occurred in task 2. There is no difference in the data of duration task completion time. There is a difference in the USE questionnaire satisfaction data between those who use eye trackers and without eye trackers for all elements. The level of website user satisfaction with eye tracker is lower than users without eye tracker.

1. Introduction
The website is a necessity in information interaction. Using the website as communication is considered effective. According to [1] active internet users for Indonesia are 72.2 million of the total population. Even the use of web traffic has a composition of 45% using a laptop/desktop, 50% using a mobile phone, and 4% using a tablet [1].

Utilization of the use of the internet is supported by [2] as a form of utilizing technology towards the positive and minimizing the negative impacts caused. The utilization of this technology must be followed by academics as a means of socialization in IT implementation and collaboration.

Website testing to improve existing facilities can use usability testing. [3] also did this in evaluating the interactive digital learning environment interface at the Parahyangan campus.

Usability test methods have been carried out by various parties in designing the appearance of their websites with the help of an eye tracker tool in maximizing usability evaluations. For example, [4] designed the appearance of a hotel website by using an eye tracker tool to usability test.

But do not let using of eye tracker as a tool can disrupt the concentration of respondents when the usability test is in progress. This is based on a discussion with one of the eye tracker users that the use of tools can allow users to feel uncomfortable. Because users have been aware that their activities are recorded directly by the device and on the screen plastered traces of exploration towards the eye. So
that in depth analysis is needed that the use of eye tracker does affect the usability results on a website. Especially the price of the tool is quite expensive, so if it is only used as a usability test, does it producing a different value.

The laboratory as student learning needs to be tested for usability in improving services to students. For this reason, the laboratory needs doing website usability test. So that access to the use of the website is considered important in improving services to students. Google Classroom is used by laboratories to assign assignments and provide assessments as a forum for interaction with students.

With the eye tracker tool that is owned by the laboratory, the assistant will test whether there is a difference between manual usability testing with the eye tracker. This is because the eye tracker tool still has limited facilities so that its use is not yet optimal. So the assistant will test based on a case study in assigning grades using Google Classroom. The case study will be compared to testing whether there is a difference between manual reusability testing with eye tracker.

2. Research Method

2.1. Research design
Researchers determining the tasks and attributes to be tested using the USE questionnaire. Then doing data collection using task scenarios based on attributes. There are 2 groups of different subjects by following 1 condition of the same treatment in a test. 1 group tested the usability of Google classroom manually based on task scenarios. While the other group uses an eye tracker to do usability testing. Then the researchers used a questionnaire to complete the usability test based on its attributes. Finally, researchers conduct data processing and analysis to draw conclusion. Analysis data using statistic test.

There are limitations to doing research. The limitation is that this usability test is only based on the website interface and the eye tracker used is Tobii Eye Tracker 4X.

2.2. Research objective
Sixteen respondents came from students who became laboratory assistants. These respondents are indeed tasked with giving grades to lower student class. Respondents are not yet accustomed to using Google Classroom. Respondents age range from 19 to 22 years.

2.3. Research procedure
Respondents working on assignments. The task is creating a task by including the work file that is located on the desktop and set the deadline according to what you want. Then give grades to students who have done the assignment. Eight respondents using the eye tracker to do the task (Figure 1 and Figure 2) and the others not using the eye tracker while doing the task. Then calculate the processing time for each task (Table 1 and Table 2). Distribute USE questionnaires to all respondents and produce data in Table 3 and Table 4.

![Figure 1. Respondents using eyetrackers to do tasks [5]](image)
3. Result and analysis

3.1. Usability test results based on time and difference test duration

Data obtained from observations in the form of time to work on two tasks on the website. The first group was given the task without using an eye tracker and the second group was using an eye tracker. The average time (Table 1) for respondents without using an eyetracker produces task 1st = 165 seconds, task 2nd = 109.375 seconds with an error 3 times in the second task. The average time (Table 2) for respondents without using an eyetracker produces task 1st = 164.75 seconds, task 2nd = 83,42857 seconds with an error 1 time in the second task.

| Respondent | Task 1 | Task 2 |
|------------|--------|--------|
| 1          | 152 s  | 156 s – failed |
| 2          | 130 s  | 92 s   |
| 3          | 126 s  | 32 s   |
| 4          | 268 s  | 45 s   |
| 5          | 129 s  | 52 s   |
| 6          | 182 s  | 184 s – failed |
| 7          | 170 s  | 172 s – failed |
| 8          | 163 s  | 142 s  |

| Nama       | Task 1 | Task 2 |
|------------|--------|--------|
| 1          | 105    | 80     |
| 2          | 215    | 90     |
| 3          | 120    | 45     |
| 4          | 160    | 50     |
| 5          | 278    | Failed |
| 6          | 81     | 121    |
| 7          | 221    | 63     |
| 8          | 138    | 135    |

Because the sample data n <30. A t-test conducting to see whether there was a difference in duration of the questionnaire between the groups without the eye tracker and the groups using eye tracker. A
summary of the results of independent t-tests is shown \( \text{sig. (p-value): } 0.561 > \alpha: 0.05 \). It can be concluded that there is no difference in the data duration of task completion time between those using eye tracker and without eye tracker.

3.2. Difference test satisfaction value using use questionnaire

Data obtained from observations in the form of satisfaction scores using the USE questionnaire on the website. The first group filled out the questionnaire without using an eye tracker and the second group using eye tracker.

| Table 3. USE questionnaire value without using eye tracker |
|----------------------------------|---|---|---|---|---|---|---|---|
| Elements                                           | Respondent |
| usefulness                                      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| it helps me be more effective.                  | 6 | 5 | 6 | 3 | 6 | 6 | 6 | 6 |
| it helps me be more productive.                 | 5 | 6 | 5 | 4 | 6 | 4 | 7 | 6 |
| it is useful.                                   | 7 | 5 | 7 | 5 | 7 | 7 | 7 | 6 |
| it gives me more control over the activities in my life | 6 | 5 | 4 | 3 | 6 | 4 | 6 | 6 |
| it makes the things i want to accomplish easier to get done. | 6 | 5 | 6 | 5 | 5 | 6 | 6 | 7 |
| it saves me time when i use it.                 | 6 | 6 | 5 | 4 | 7 | 6 | 6 | 6 |
| it meets my needs.                              | 6 | 5 | 5 | 4 | 6 | 4 | 6 | 6 |
| it does everything i would expect it to do.     | 6 | 5 | 5 | 4 | 6 | 4 | 6 | 6 |
| ease of use                                     |   |   |   |   |   |   |   |   |
| it is easy to use.                              | 5 | 6 | 5 | 5 | 6 | 6 | 6 | 5 |
| it is simple to use.                            | 6 | 5 | 5 | 4 | 6 | 7 | 6 | 5 |
| it is user friendly.                            | 6 | 6 | 6 | 4 | 5 | 7 | 6 | 6 |
| it requires the fewest steps possible to accomplish what i want to do with it. | 6 | 6 | 5 | 3 | 6 | 7 | 6 | 6 |
| it is flexible.                                 | 6 | 5 | 5 | 4 | 6 | 7 | 7 | 7 |
| using it is effortless.                        | 6 | 5 | 5 | 4 | 6 | 7 | 3 | 6 |
| i can use it without written instructions.     | 6 | 6 | 6 | 5 | 5 | 7 | 5 | 6 |
| i don't notice any inconsistencies as i use it. | 6 | 6 | 4 | 3 | 5 | 7 | 5 | 6 |
| both occasional and regular users would like it. | 7 | 5 | 5 | 3 | 5 | 7 | 6 | 6 |
| i can recover from mistakes quickly and easily. | 6 | 5 | 6 | 4 | 6 | 7 | 6 | 6 |
| i can use it successfully every time.           | 7 | 5 | 7 | 3 | 6 | 7 | 6 | 6 |
| ease of learning                               |   |   |   |   |   |   |   |   |
| i learned to use it quickly.                   | 6 | 6 | 5 | 4 | 5 | 7 | 6 | 6 |
| i easily remember how to use it.               | 6 | 5 | 7 | 4 | 7 | 7 | 6 | 6 |
| it is easy to learn to use it                  | 7 | 5 | 6 | 4 | 6 | 7 | 6 | 6 |
| i quickly became skillfull with it.            | 6 | 7 | 5 | 4 | 6 | 6 | 5 | 6 |
| satisfaction                                   |   |   |   |   |   |   |   |   |
| i am satisfied with it.                        | 6 | 5 | 5 | 5 | 5 | 7 | 6 | 6 |
| i would recommend it to a friend.              | 6 | 5 | 6 | 5 | 5 | 7 | 7 | 6 |
| it is fun to use.                              | 6 | 5 | 5 | 4 | 6 | 5 | 6 | 7 |
| it works the way i want it to work.            | 5 | 6 | 5 | 5 | 6 | 7 | 5 | 7 |
| it is wonderful.                               | 7 | 6 | 5 | 5 | 5 | 7 | 5 | 6 |
| i feel i need to have it.                     | 6 | 6 | 5 | 5 | 6 | 7 | 6 | 6 |
| it is pleasant to use.                         | 6 | 5 | 5 | 4 | 5 | 7 | 6 | 6 |
| Averages                                      | 6.07 | 5.43 | 5.37 | 4.10 | 5.73 | 6.37 | 5.87 | 6.07 |

Table 4. USE questionnaire value using eye tracker
### Elements

| Elements                                                                 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|------------------------------------------------------------------------|---|---|---|---|---|---|---|---|
| usefulness                                                             |   |   |   |   |   |   |   |   |
| it helps me be more effective.                                         | 3 | 5 | 5 | 4 | 5 | 6 | 6 | 3 |
| it helps me be more productive.                                         | 6 | 4 | 5 | 3 | 7 | 6 | 6 | 6 |
| it is useful.                                                          | 5 | 4 | 5 | 4 | 6 | 5 | 5 | 5 |
| it gives me more control over the activities in my life.               | 6 | 6 | 5 | 4 | 5 | 4 | 4 | 6 |
| it makes the things I want to accomplish easier to get done.           | 6 | 5 | 5 | 5 | 6 | 6 | 6 | 6 |
| it saves me time when I use it.                                        | 6 | 5 | 5 | 4 | 6 | 5 | 5 | 6 |
| it meets my needs.                                                     | 3 | 4 | 5 | 3 | 5 | 4 | 4 | 3 |
| it does everything I would expect it to do.                            | 4 | 6 | 5 | 4 | 5 | 5 | 5 | 4 |
| ease of use                                                            |   |   |   |   |   |   |   |   |
| it is easy to use.                                                     | 5 | 4 | 5 | 6 | 5 | 4 | 4 | 5 |
| it is simple to use.                                                   | 6 | 4 | 5 | 5 | 5 | 6 | 6 | 6 |
| it is user friendly.                                                   | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 4 |
| it requires the fewest steps possible to accomplish what I want to do. | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 |
| it is flexible.                                                        | 5 | 6 | 5 | 5 | 6 | 4 | 4 | 5 |
| using it is effortless.                                                | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 5 |
| i can use it without written instructions.                             | 5 | 2 | 4 | 5 | 5 | 6 | 6 | 5 |
| i don't notice any inconsistencies as I use it.                       | 3 | 4 | 5 | 4 | 4 | 5 | 5 | 3 |
| both occasional and regular users would like it.                       | 2 | 5 | 4 | 4 | 6 | 6 | 6 | 2 |
| i can recover from mistakes quickly and easily.                        | 2 | 5 | 5 | 4 | 6 | 5 | 5 | 2 |
| i can use it successfully every time                                   | 2 | 3 | 5 | 5 | 6 | 5 | 5 | 2 |
| ease of learning                                                       |   |   |   |   |   |   |   |   |
| i learned to use it quickly.                                           | 2 | 5 | 5 | 6 | 5 | 4 | 4 | 2 |
| i easily remember how to use it.                                       | 3 | 3 | 5 | 6 | 5 | 6 | 6 | 3 |
| it is easy to learn to use it                                          | 3 | 4 | 5 | 6 | 6 | 7 | 7 | 3 |
| i quickly became skillfull with it.                                    | 3 | 4 | 5 | 5 | 5 | 5 | 5 | 3 |
| satisfaction                                                           |   |   |   |   |   |   |   |   |
| i am satisfied with it.                                                | 5 | 5 | 5 | 5 | 6 | 7 | 7 | 5 |
| i would recommend it to a friend.                                      | 5 | 4 | 5 | 5 | 5 | 6 | 6 | 5 |
| it is fun to use.                                                      | 3 | 5 | 5 | 5 | 5 | 6 | 6 | 3 |
| it works the way I want it to work.                                    | 4 | 6 | 5 | 4 | 6 | 5 | 5 | 4 |
| it is wonderful.                                                       | 3 | 5 | 5 | 4 | 5 | 5 | 5 | 3 |
| i feel I need to have it.                                              | 4 | 4 | 5 | 5 | 6 | 6 | 4 | 4 |
| it is pleasant to use.                                                 | 3 | 5 | 5 | 4 | 5 | 6 | 6 | 3 |
| Averages                                                               | 4.03 | 4.57 | 4.93 | 4.60 | 5.40 | 5.33 | 5.33 | 4.03 |

The analysis carried out was the analysis of multiple sample hypothesis testing using independent t test because the sample data n <30. T test was conducted to see whether there were differences in the values of the questionnaire between the groups without the eye tracker and the groups using the eye tracker.

T-value on the variable time duration for the elements of usefulness, ease of use, ease of learning, satisfaction, are in the rejection area and the value of sig. (p-value) < 0.05. P-value usefulness = 0.017, ease of use = 0, ease of learning = 0.007, satisfaction = 0.001. It can be concluded that there are differences in USE questionnaire satisfaction data values between those using eye tracker and without eyetracker for all elements.
Based on Table 5, the conclusion column the absolute sign indicates the mean value. The mean value of the Eye tracker group is lower than the without using eyetracker group for each USE Element. So it can be said overall that the level of satisfaction of website users using eye tracker is lower than without eye tracker.

| Variable         | Description | $\bar{x}$ | Conclusion                        |
|------------------|-------------|-----------|-----------------------------------|
| Usefulness       | Eyetracker  | 4,93      | $|\bar{x}_{\text{Eyetracker}}| < |\bar{x}_{\text{Non Eyetracker}}|$ |
|                  | Non Eyetracker | 5,53     |                                   |
| Ease of Use      | Eyetracker  | 4,78      | $|\bar{x}_{\text{Eyetracker}}| < |\bar{x}_{\text{Non Eyetracker}}|$ |
|                  | Non Eyetracker | 5,59     |                                   |
| Usefulness       | Eyetracker  | 4,82      | $|\bar{x}_{\text{Eyetracker}}| < |\bar{x}_{\text{Non Eyetracker}}|$ |
|                  | Non Eyetracker | 5,78     |                                   |
| Ease of Learning | Eyetracker  | 5,04      | $|\bar{x}_{\text{Eyetracker}}| < |\bar{x}_{\text{Non Eyetracker}}|$ |
|                  | Non Eyetracker | 5,69     |                                   |

4. Conclusion
Based on Table 5 the mean values of the eye tracker group are lower than the without eye tracker group for each USE Element. So it can be said overall that the level of satisfaction of website users with an eye tracker is lower when compared to website users without an eye tracker.

Based on the results of interviews about the satisfaction of using an eye tracker while doing a task, respondents were disturbed by the installation of an eye tracker in the area near the monitor both in terms of size and placement position, thereby reducing the concentration of respondents when doing a given task.

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