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Teachers' website design experiences and usability test: the case of weebly.com

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Abstract

This study was conducted in order to examine the process by which teachers designed a website. For this purpose, www.weebly.com, which is used as a website building tool, was selected and teachers were given tasks for web designing. Experiments were designed differently for experiment and control groups. Before performing the tasks, an introduction video was shown to the experiment group. Then, interview questions about the contribution of introduction videos and usability of website were asked. According to the results, the group that watched the introduction video completed the tasks in a shorter time than the group who did not watch the videos. At the same time, the group who watched introduction videos before using the site was able to complete more tasks than the group that did not watch the videos. These results show that the use of introduction videos as a navigation facilitator enhances the usability.

Keywords: Website design experience, teacher education, usability, eye tracking.

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1. Introduction

Usability is that users can use the system easily and effectively when the necessary training or user support is given to perform the assigned tasks (Yeniad, Mazman, Tuzun & Akbal, 2011). An increase in the satisfaction helps increase the usage rate of a system as well (Gurses, 2006). The usability describes the quality of experience with software or information technology, taking into account a user's own needs, values, capabilities and constraints (Leavitt & Shneiderman, 2006).

The usability of a website influences the users' satisfaction and their intention to use that website again afterwards. Users abandon to use the websites that are hard to use (Belanche, Casalo & Guinaliu, 2012; Nielsen, 2013). It is thought that the usability of educationally designed websites may have a direct impact on the success; on the contrary, a website that is difficult to use may lead to move away from the basic goals of education. A number of studies have been reported on increasing students' learning about the efficiency they obtain from an educationally designed website (Coklar & Bagci, 2010; Crowther, Keller & Waddoups, 2004; Isman & Isbulan, 2009; Virvou & Katsionis, 2008).

One of the most effective methods to measure the usability of a system is the eye-tracking method. By recording and analyzing the eye movements of an individual in an online environment, it is often used to identify the areas where he or she focuses and the tracks that the eyes follow on the screen. This method reveals which area of the website users try to carry out the tasks that they could not do within the website (Bayram & Mutlu-Bayraktar, 2012).

In order to measure the usability, it is necessary to have an idea about the areas users are looking and focusing, and the method of eye tracking is very important in this regard (Duchowski, 2007; Holmqvist et al., 2011; Kalayci, Tuzun, Bayrak, Ozdinc & Kula, 2011; Nielsen & Pernice, 2010; Winke, Godfroid & Gass, 2013). Comparing verbal reports and eye movement records in eye tracking tests is an effective way with regard to providing complementary information of two studies and using in the study (Goldberg & Kotval, 1999; Leow, Grey, Marijuan & Moorman, 2014). Eye tracking analyses have been used in many educational research studies and usability studies over the last 20 years (Bergstrom & Schall, 2014; Elbabour, Alhadreti & Mayhew, 2018; Wang et al., 2018).

The main purpose of creating websites is to deliver the content in the most efficient way to the targeted user group. However, the most important factor that should be considered when presenting content to the user is that there should be a user interface where the users reach the information easily and in a short time. In general, users tend to prefer another website with similar content by easily giving up on websites that have complex interfaces, which, in turn, affects the usability of some websites adversely.

As a result of study on the use of universities' websites, while the typographic items such as font diversity are used extensively, it has been determined that the use of items such as location information and assistive tools for disabled people is low (Izmirli, Donmez & Kabakci-Yurdakul, 2012). Like in most systems, there are user problems in educational websites and navigation facilitators prepared in line with user habits are recommended tools to solve these problems.

There are many ways to enhance the usefulness of a site as a navigation facilitator. Based on the findings of the research they conducted with 706 participants, Tullis et al. (2005) found that using the drop-down menu will be useful to facilitate the navigation on the website. Izmirli, Donmez and Yurdakul (2012) defined the navigation facilitators as recommended tools to solve the problem of getting lost in the website. They indicated some methods such as sitemap, in-site search engine, page headers, homepage link and showing previously surfed page link in a different colour.

Navigation facilitators aim to enable users to reach their aims in a shorter time and more easily. A number of studies have been conducted to determine the effective user facilitators for this purpose. Miller (2017) stated that using same style fonts and colours in website designs would make the site users feel more comfortable. Page titles should clearly state what the page is exactly about. Website navigation should be open-structured and intuitive. The sections that contain copyright information

should be at the bottom, the least noticeable parts of the website. There should be a back to home button within a link on the site that the users enter. The site search tool is also very helpful for users when they have difficulty in finding what they are looking for. It has been seen that users are having difficulty navigating though the sites where the design is very different from other websites. For this reason, familiarity on websites is very important for usability. This does not mean that the site designs should not be unique, but the originality that is adapted well influences the navigation on a website positively (Miller, 2017; Shannon, 2010).

According to Shergill and Chen (2005) website design factors are measured by means of 'Perceived Ease of Use', 'Navigation' and 'Personalisation'. Similarly, Yang, Hu and Chen (2005) expressed that graphic and structural content designs in a website are in a significantly related to perceived ease of use, navigation and personalisation.

The purpose of this study is to examine the teachers' experiences in the www.weebly.com website, which is used as a website building tool, by using the eye tracking method as a usability test. Weebly is one of the easiest ways to design a website or blog page. With drag and drop method, it allows you to create professional pages without expert knowledge on web page creation. In this study, eye-tracking data and personal evaluations of the users' on the usability of the site were examined during the course of web designing by teachers, and the results obtained were included. The results were examined in the direction of the tasks given during website design.

This study investigated the following research questions:

- RQ1. How are the participants' number of tasks completed? (Effectiveness)
- RQ2. How are the participants' duration on tasks?/How long is the time spent by participants on tasks? (Efficiency)
- RQ3. How is the usability analysis of tasks? (Usability)
- RQ4. What are the attitudes, recommendations and satisfaction levels of the participants about weebly.com website's usability? (Satisfaction)
- RQ5. How are participants' heat maps and fixation numbers related to tasks?
- RQ6. Is there any difference in the number of tasks completed between experimental and control groups?

2. Method

In this study, while the teachers were using www.weebly.com site, its usability was examined by means of eye-tracking method. With this tool, which allows users to design an online website and update their website, each account holder can design their own website and share content after registering.

In this study, Comparative Static Group Pattern was determined as the research model. In one of the weak experimental patterns, Comparative Static Group Pattern, the participants were divided into groups formed by random assignment as experiment and control group. Analysis was made by comparing the results of two groups after the experiment (Campbell & Stanley, 2015; Karasar, 2011).

2.1. Participants

In the experiment, 17 women and 13 men, totaling 30 teachers are included. Their age average is 24.3. The participants are divided into groups formed by random assignment as experiment (N = 15) and control group (N = 15).

2.2. Data collection tools

The research is conducted at Human–Computer Interaction Laboratory. Data are collected with eye-tracking and semi-structured interview methods. In the study, eye-tracking movements from

weebly.com website are recorded. Eye calibrations were made for participants first. Then, they were asked to complete the tasks assigned by the researchers; the time spent during the tasks and whether the task was completed or not are recorded.

Participants were invited to the Human–Computer Interaction Laboratory according to appointment times. Participants were then taken into the laboratory one by one to participate in the process of experiment. Before the experiment started, the participants were asked to follow the points that appeared on the scene with his/her eyes in order to calibrate the eye tracking device. If the screen calibration was at an appropriate level, the participant was asked to view a website on weebly.com.

Eye-tracking data can provide valuable information about the attention processes of the learners. The participants studied this material and they were tested individually at the Human–Computer Interaction Laboratory.

In this study, participants used an eye-tracking device (test-experimental computer), an observer computer and some software.

2.2.1. Eye-tracking device (Test-experimental computer)

It is a device that provides data about where, what, how long and how many times the participant looks at the screen and records eye movements during the time that the user performs the test. The device is also connected to the observer computer that records screen image of the user.

2.2.2. Observer computer

The experiment was prepared and the experimental processes were carried out in the Human–Computer Interaction Laboratory, and data were recorded and analyzed using the observer computer.

2.2.3. Software

iView X is the software that provides a connection between eye-tracking device and observer computer.

Experiment Center is the software that enables to form eye-tracking test, manage and control the test. The experiments created with Experiment center software is connected to the user's computer via iViewX software. Then, record is performed with BeGaze software. BeGaze is the software that keeps the records for evaluation of stored data.

2.3. Experiment process

This study was carried out in the Human–Computer Interaction Laboratory. The experiment was pre-recorded as screen recording by the 'SMI Experiment' program on the test computer with the eye-tracking device installed. The participant was given a task draft prepared by the researcher. Throughout the experiment, it has been explained that the tasks in the draft should be done in the weebly.com website. In addition to this program, the recording of the program 'Noldus Observer 9.0' which helps to get video, audio, mouse, keyboard and screen recordings simultaneously, was started. The tasks for which participants were required to complete were:

1. Create a new page
2. Add a button
3. Add an image
4. Change the name of website
5. Publish the website

Experiments were designed differently for experiment and control groups. Before performing the tasks, an introduction video was shown to the experiment group. All participants were instructed

about the tasks to complete in order and expected to perform them. Then, interview questions about the contribution of introduction videos and usability of the website were asked.

2.4. Data analysis

The records showing eye and mouse movements recorded by the experiment program were analyzed by Be Gaze program. In the analysis, fixation numbers and durations, heat maps, clicking points data were obtained. The obtained data were evaluated through Chi-square test in SPSS 20.0 program. Interview records were analyzed by the researchers and interpreted with statistical results.

3. Results

3.1. Usability analysis

Tasks determined within the scope of the study were analyzed and evaluated in terms of usefulness of the site together with eye-tracking data. Table 1 presents the overall completion times and completion counts of the tasks.

Table 1. Average completion time (in seconds) and completion counts of tasks

	Experimental group		Control group	
Tasks	**Completion times**	**Completion counts**	**Completion times**	**Completion counts**
1	51.60	7	49.80	12
2	43.80	4	33.60	14
3	52.20	5	36	13
4	51	6	36	13
5	51.60	11	50.40	14

3.1.1. First task analysis: create a page

Usefulness: The average completion time of the first task was 51.60 seconds in the group that did not watch the introduction videos and 49.80 seconds in the group that watched the introduction videos (Table 1).

Effectiveness: 19 of 30 participants who participated in the experiment could complete the task (Table 1).

Efficiency: Participant who completed the task fastest was in 9 seconds and the slowest was in 123.60 seconds. This is a task in which the number of completions is low and completed in the longest time. It can be argued that a task with a maximum number of clicks of participants is a low-efficiency task.

Satisfaction: The two participants completed the task at 123.60 and 82.20 seconds and much longer than the other users who completed the task. The reason for this situation is that after entering the system, they focused on the 'Create in the top menu' tab instead of the 'Pages in the top menu' tab, thinking that this tab is more relevant to this task (Figures 1 and 2).

Figure 1. Fixation numbers regarding page creation task

Figure 2. Heat map regarding page creation task

3.1.2. Second task analysis: add a button

Usefulness: The average completion time of the second task was 43.80 seconds in the group that did not watch the introduction video, and 33.60 seconds in the group that watched the introduction video (Table 1). Looking at the fixation numbers and heat maps, it appears that they focus on the left menu most (Figures 3 and 4).

Effectiveness: 18 of 30 participants who participated in the experiment could complete the task (Table 1).

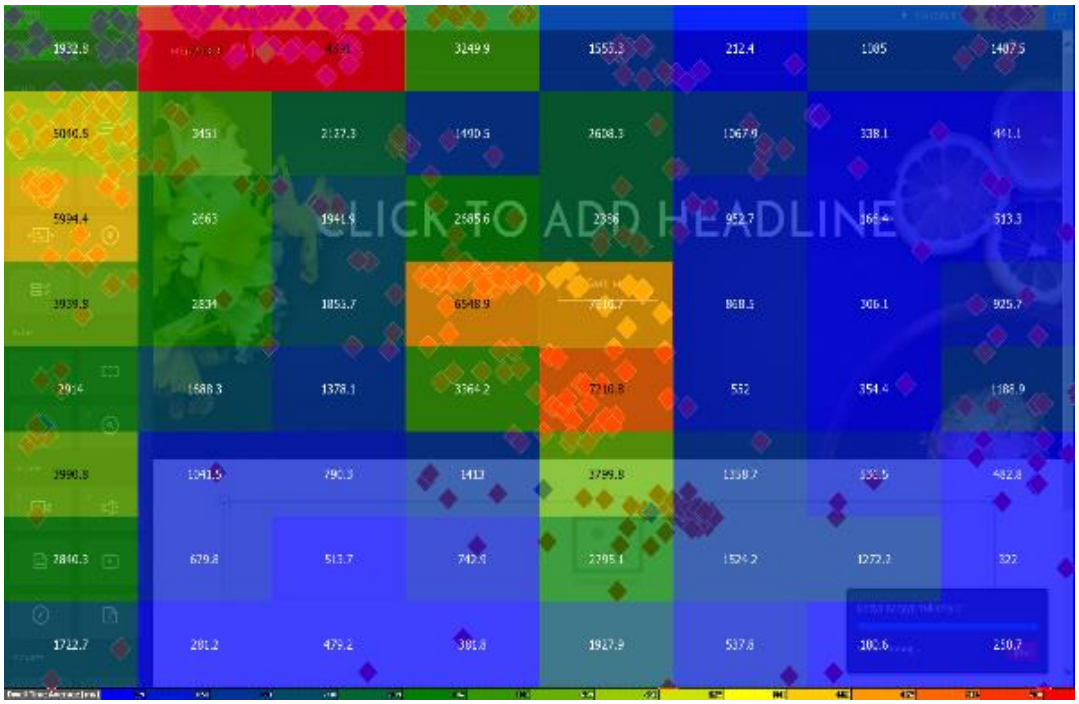

Figure 3. Fixation numbers regarding button addition task

Figure 4. Heat map regarding button addition task

Efficiency: The participant who completed the task fastest was in 9 seconds and the slowest completed was in 76.20 seconds. The number of completions is low, but it is one of the tasks completed as fast as possible. It is also one of the tasks with the most clicks.

Satisfaction: Some of the participants who completed the task took a little longer compared to the other users. The reason for this situation is that they tried to complete the task by making changes on the tab attached to the page instead of using the button element tab in the 'items and applications'

section on the left menu. Participants who found the button just clicked on it and seeing that it was not added, they preferred to skip this task. Participants' comments on this task were examined; 12 of the participants stated that they found the button but they did not understand why it was not added.

3.1.3. Third task analysis: add an image

Usefulness: The average completion time of the third task is 52.20 seconds in the group that did not watch the introduction videos, and 36 seconds in the group that watched the introduction videos (Table 1).

Effectiveness: 18 of 30 participants who participated in the experiment could complete the task (Table 1).

Efficiency: The participant who completed the task fastest was in 9 seconds and the slowest was in 168 seconds. Although the number of completing is low, it is one of the tasks completed in the fastest time.

Satisfaction: Participants who completed the task for the longest time lost a great deal of time on the left menu after entering the system. Other participants indicated that they could complete faster because of its similarity to the previous task. Looking at the eye-tracking data, it seems that they focused more on the left menu.

Figure 5. Fixation numbers regarding image addition task

Figure 6. Heat map regarding image addition task

3.1.4. Fourth task analysis: change the name of website

Usefulness: The average completion time of the fourth task is 51 seconds in the group that did not watch introduction videos and 36 seconds in the group that watched introduction videos (Table 1).

Effectiveness: 19 of 30 participants who participated in the experiment could complete the task.

Efficiency: The participant who completed the task fastest was in 9 seconds and the slowest was in 168 seconds. It is one of the tasks with a high number of completions and is one of the tasks completed fastest.

Satisfaction: Looking at participant comments regarding this task, it was observed that the number of completions increased due to the familiarity with the system. Participants who could not complete stated that they preferred to skip the task by not being able to decide what the site name was. Looking at the eye-tracking data, it appeared that the participants were generally focused on the correct places to complete the task (See Figures 7 and 8).

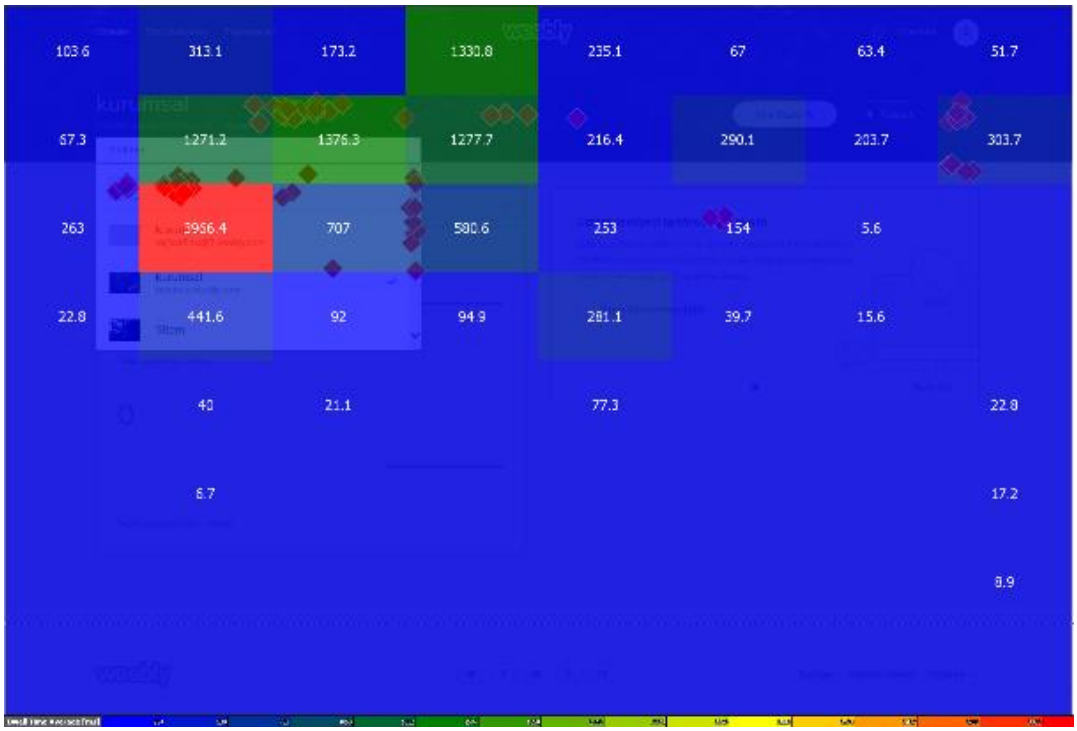

Figure 7. Fixation numbers regarding name of site change task

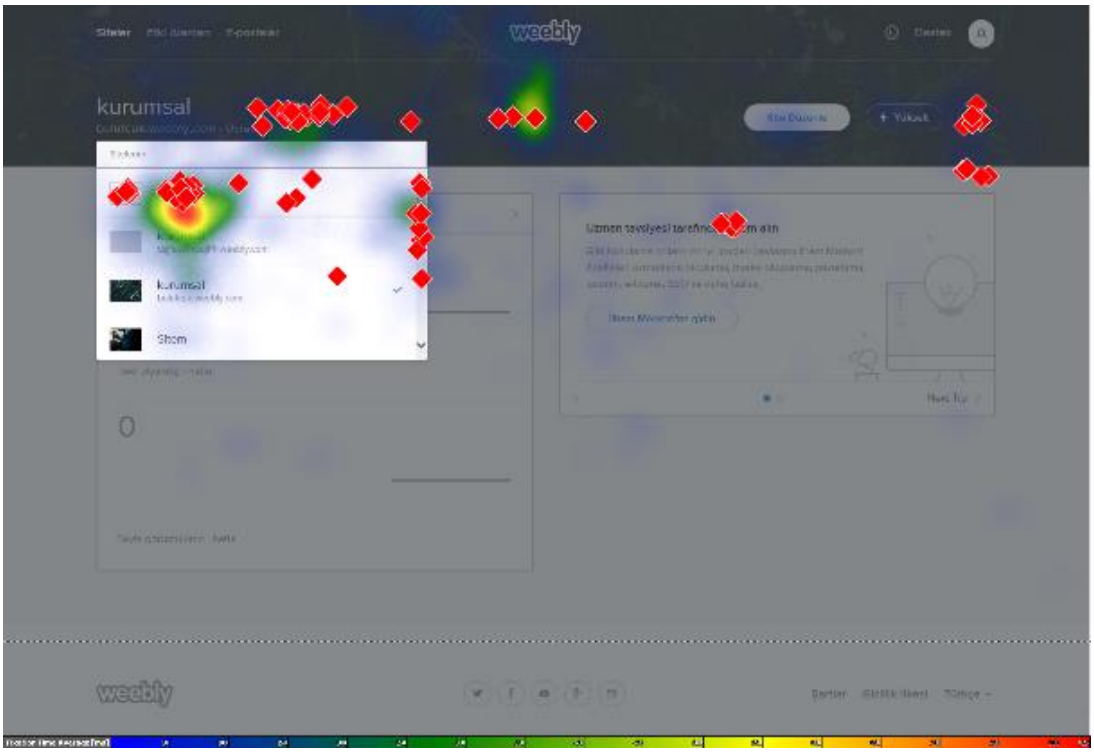

Figure 8. Heat map regarding name of site change task

3.1.5. Fifth task analysis: publish

Usefulness: The average completion time of the fifth task was 51.60 seconds in the group that did not watch the introduction videos and 50.40 seconds in the group that watched the introduction videos (Table 1).

Effectiveness: 25 of 30 participants who participated in the experiment could complete the task.

Efficiency: The participant who completed the task fastest was in 12 seconds and the slowest was in 98.40 seconds. It is the task completed most and in the shortest time by the participants. Eleven people who did not watch the video and fourteen people who watched the video completed this task in less than 30 seconds.

Satisfaction: With regard to this task, the participants stated that the broadcast button was shown with a button that could be seen very easily. When looked at the fixation numbers and heat maps, it was seen that they completed tasks with fewer numbers of clicks focusing on the correct place (Figures 9 and 10).

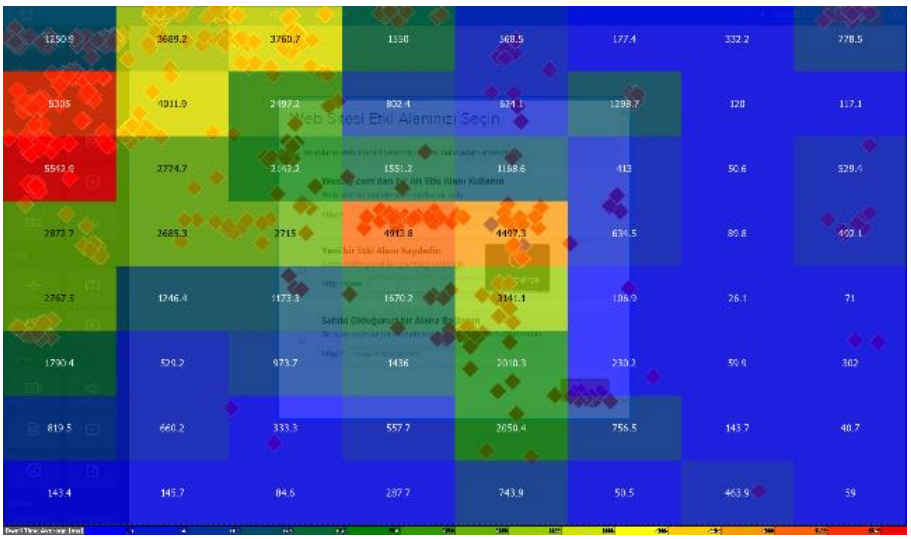

Figure 9. Fixation numbers regarding publishing the website task

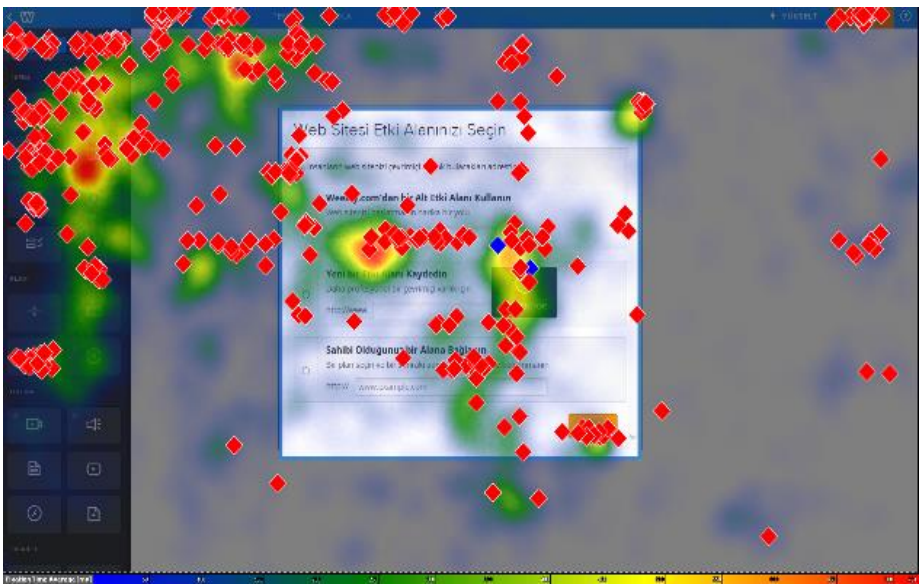

Figure 10. Heat map regarding publishing the website task

3.2. Usability analysis regarding experimental and control groups' data

A nonparametric Mann–Whitney *U* test was performed to examine whether there was a significant difference between the groups who watched the introduction video and who did not in terms of the duration of task completion, since the data did not show a normal distribution. In Table 2, the results of the Mann–Whitney *U* test are seen on the completion time of teachers' tasks.

Table 2. Results of Mann–Whitney *U* tests regarding the completion times of tasks of groups

Groups	*N*	Mean Rank	Sum of Ranks	*U*	*Z*	*p*
Experimental	15	19.33	290.00	55.00	−2.385	0.017
Control	15	11.67	175.00			
Total	30					

The findings of the Mann–Whitney *U* test presented in Table 1 show that the group (experimental) that watched video completed the tasks in a shorter time than the group (control) who did not watch.

3.2.1. New page creation task analysis

Looking at the results of the chi-square test of the participants' video watching status and the success of the new page creation task, it was seen that those who viewed the video were able to complete the task more than those who didn't ($p < 0.05$, Table 3).

Table 3. Chi-square test results regarding participants' video watching status and new page creation task achievements

Task achievements	Successful		Unsuccessful		Total		*p*
Groups	*f*	%	*f*	%	*f*	%	
Experimental	12	80.0	3	20.0	15	100.0	0.000
Control	7	46.7	8	53.3	15	100.0	
Total	19	63.3	11	36.7	30	100.0	

3.2.2. Button addition task analysis

Looking at the chi-square test results of participant's video watching status and button addition task, it was seen that those who viewed the video were able to complete the task more than those who didn't ($p < 0.05$, Table 4).

Table 4. Chi-square test results regarding participants' video watching status and button adding status

Task achievements	Success		Unsuccess		Total		*p*
Groups	*f*	%	*f*	%	*f*	%	
Experimental	14	93.3	1	6.7	15	100.0	0.000
Control	4	26.7	11	73.3	15	100.0	
Total	18	60.0	12	40.0	30	100.0	

3.2.3. Picture addition task analysis

Looking at the results of the chi-square test of participants' video watching status and the success to add pictures, it was seen that experimental group could complete the task more ($p < 0.05$, Table 5).

Table 5. Chi-square test results regarding participants' video watching status and adding picture achievements

Task achievements	Success		Unsuccess		Total		*p*
Groups	*f*	%	*f*	%	*f*	%	
Experimental	13	86.7	2	13.3	15	100.0	0.003
Control	5	33.3	10	66.7	15	100.0	
Total	18	60.0	12	40.0	30	100.0	

4. Discussion

In this study, by taking the example of 'weebly.com' usability problems with websites which are used for free and easily designing websites were determined and solution recommendations were offered. This site is often used for many purposes such as a website building tool, social, promotion, marketing, education and so on. The usefulness of this site, which can contribute to educators as a free tool that can be used to provide educational content, has been evaluated. The site's usability test was conducted with 30 participants and they were asked to complete 5 tasks related to the site. Among the participants, 15 of them watched a short introduction video presenting the site before the tasks on site, while the other 15 used the site without watching the introduction videos.

According to the results obtained to investigate the contribution of watching videos for a website that the users will use for the first time, the group that watched the video completed the tasks in a shorter time than the group who did not watch the videos. At the same time, the group who watched introduction videos before using the site was able to complete more tasks than the group that did not watch the introduction videos. These results show that the use of introduction videos as a navigation facilitator enhances the usability. The literature also emphasises the impact of navigation facilitators on usability (Shannon, 2010; Tullis et al., 2005).

The usage behaviors of groups who visit the website for the first time and who are familiar with the website interface are important for usability analysis (Miller, 2017). In this study, the usage analysis of both groups was evaluated and overall evaluation of the website in terms of effectiveness, efficiency, usability and satisfaction was made. In all tasks, the number of tasks completing is higher in the group who watched the introduction videos. The group who formed the sitemap in their minds and gained familiarity with the site after watching the introduction videos completed all the tasks in a shorter time than the other group. In addition, according to the results, the users completed the final tasks in a shorter time. This result, which emerged in parallel with the increase in the familiarity with the website, shows similar findings with many studies (Bhattacherjee, 2001; Charlend & LeRoux, 2011; Limayem & Cheung, 2008; Miller, 2017).

Eye-tracking analyses were performed for each task. When the eye movements were examined, it was found that the users first looked at the middle area, then the left column. If the locations of the objects were not learned, it was seen that there was no focus on the right and bottom parts of the page. As parallel findings to these data, the tasks that could be done from the middle and left areas were completed in a shorter time. Similar findings obtained in the research studies are about the fact that focusing a lot on middle and left areas affects usability (Bayram & Yeni, 2011; Schroeder, 1998; Yaprakdal, 2006). In the light of these results, it can be emphasised that objects that are absolutely required to be seen by the user should be placed in the middle or left part of the screen.

In analyzing eye-tracking data, the result is that users are more likely to click instead of dragging and dropping. Many users in the task of adding buttons waited for the button to be added when they clicked the button, and they want to skip without completing the task because they could not realise that they were supposed to add them by dragging. This result is among the important results of the study as a striking outcome of that users prefer to click instead of dragging.

Buttons with similar names caused the participants to complete the task late or made them skip the task. In the usability studies, it was also indicated that when the button names recall the names of other buttons, when they are not clear enough or when their functions are not explicitly named, it decreases the usability (Cockrell & Jayne, 2002; Mutlu Bayraktar, 2017; Tonbuloglu & Aydin, 2013). In the light of these results, it was revealed that we need to make an arrangement about the names and functions of the buttons in weebly.com. By updating the names of similar buttons, the usability can be improved. It is also suggested that the names of the buttons that conflict with their functions or submenus be rearranged.

Taking into consideration the result of this study, being able to make the tasks on the top and left side of weebly.com as web building tool is a feature that increases the usefulness. The dimensions of objects and texts are not too small to be overlooked and are not big enough to distract the user. There are proportions between object dimensions and gaps in the site. It should be taken into account that the habits of users and their previous experience are influential on their navigation on site. The names of the buttons used must be appropriate to their task and clearly different from each other. It should be kept in mind that web pages with user-focused and usability-tested interfaces are preferred by users over other websites with similar content.

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