

Investigating visual engagement of Generation Z with Presidential campaign infographics through Eye-Tracking technology

Evta Indra¹, Hidayati Hizkia¹, Hardiansah Ginting¹, Calvin Stanley¹, Pratiwi Cristin Harnita², Deni Adha Akbari³, and Rizki Edmi Edison^{4,5*}

¹ Department of Information Systems, Universitas Prima Indonesia, Indonesia

² Department of Communication Science, Universitas Kristen Satya Wacana, Indonesia

³ Department of Management, Universitas Muhammadiyah Prof Dr HAMKA, Indonesia

⁴ Institute for Leadership, Innovation and Advancement, Universiti Brunei Darussalam, Brunei Darussalam

⁵ Neuroscience Institute, Universitas Prima Indonesia, Indonesia

* Corresponding author's e-mail: edmi.edison@ubd.edu.bn

ABSTRACT

This study was designed to investigate the visual engagement of Generation Z with Indonesian presidential election campaign infographics utilizing eye-tracking technology. Notably, Generation Z forms a significant segment of first-time voters in the 2024 General Election and plays an integral role in political decision-making processes. Despite their pivotal role, a marked disengagement with political activities among this demographic presents significant challenges. Prior research has demonstrated that visual attention is modulated by experiential factors and personal biases. Consequently, this investigation seeks to elucidate the impact of infographics on the visual attention of participants with pre-established preferences for presidential candidates. Employing eye-tracking technology facilitated an objective assessment of the participants' subconscious reactions to the infographics. This study analyzed the distribution of visual attention across six defined Regions of Interest (ROI) among 60 participants. The findings reveal that 50% of the participants directed their gaze predominantly at the names of the candidate pairs, 27% at the image of the presidential candidate, 15% at quotes, 5% at the image of the vice-presidential candidate, 2% at the candidate number, and 1% at the vision statement. Additionally, it was observed that 55% of the participants consistently fixated on the infographics that corresponded to their preferred candidate pair from the onset to the conclusion of the recording, while 45% demonstrated variability in their viewing patterns. These insights afford valuable implications for political strategists aiming to forge more effective communication strategies with Generation Z, thereby enhancing their engagement in the political discourse, particularly in the context of general elections.

Keywords:

Visual Attention; Eye Tracking; Generation Z; Political Campaign

Introduction

Democracy, delineated as a governance framework that facilitates extensive participation in political decision-making, plays a pivotal role in shaping the societal fabric. Within the context of Indonesia, democracy is deeply entrenched in the Pancasila ideology, which aspires to foster a milieu of justice, integrity, and transparency (Fawiad, 2023). As the 2024 General Election approaches, Generation Z—comprising first-time voters aged 17 to 24—emerges as a formidable electoral demographic. According to data from the General Election Commission (KPU), this cohort, along with millennials, constitutes approximately 55% of the electorate (Sompa, 2023).

However, political engagement among Generation Z presents distinct challenges. Empirical evidence suggests a pronounced disengagement from traditional political activities, with a preference for daily academic and personal endeavors over direct political involvement (Lemhanas, 2022). This phenomenon warrants rigorous scholarly investigation.

Recent advancements in campaign strategies highlight the growing utilization of online infographic media as a potent tool for engaging young voters, particularly Generation Z. Historical

precedents, such as the impactful "Hope" brochure from Obama's 2009 campaign, underscore the efficacy of tailored media strategies in political mobilization (Viatra, 2019)-

This study focuses on the examination of Generation Z's visual attention to presidential election campaign infographics utilizing eye-tracking technology. This methodological approach builds on previous research that explored the visual attention of smokers versus nonsmokers to health warnings on cigarette packs, revealing that visual engagement is significantly shaped by personal experiences and biases (Edison et al., 2021). Eye-tracking technology serves as a crucial neuromarketing instrument, providing objective insights into subliminal responses across various advertising formats, including digital, print, and broadcast media (Hula, 2023). This study employs a webcam integrated with Gaze Recorder software, offering a cost-effective alternative to traditional eye-tracking devices (Taim et al., 2023).

By applying this technology, the research aims to ascertain the impact of infographics on the visual attention of voters who have predetermined presidential preferences. The findings are expected to provide valuable insights for political strategists and communicators, enabling them to devise more effective engagement tactics with Generation Z, thereby enhancing their participation in the political process, particularly in electoral contexts.

Methods

Region of interest

This research uses the eye-tracking method which includes ROI. Region of Interest (ROI) is a defined area for measuring and analyzing visual attention. ROI allows the isolation and examination of specific parts of the visual stimulus. In this study, ROI refers to the areas in the presidential election campaign infographic that attract Generation Z's attention.

Eye-Tracking

Eye tracking is a technology that involves observing and measuring eye position and eye movements. It allows for the tracking of the direction and duration of gaze at a given point and the measurement of blink patterns. In other words, eye tracking can detect user presence, visual attention, and gaze duration. The following is an explanation of dwell time, view by, first view: Dwell time, also known as fixation duration, refers to the duration for which a user's gaze remains focused on a specific area of an image or screen. It is a crucial metric in eye-tracking research, providing insights into the level of attention and interest a user devotes to particular elements. Higher dwell times generally indicate greater engagement and focus on those areas. The first view represents the initial instance when a user's gaze lands on a specific area of the image or screen. It highlights the elements that capture immediate attention upon initial exposure. Analyzing first-view data can reveal which elements users prioritize and where their attention is naturally drawn. View By provides a more granular breakdown of how users visually explore an image or screen. It tracks the sequence and duration of fixations across the entire viewing period, revealing the path users' eyes take as they navigate the content. This metric offers valuable insights into user engagement patterns and content consumption strategies. By analyzing these three parameters in conjunction, researchers can gain a holistic understanding of user behavior and attention patterns. Dwell time indicates the depth of engagement, the first view reveals initial points of interest, and the view tracks the overall visual exploration journey. Together, these metrics provide a comprehensive picture of how users interact with and perceive visual content.

Heatmaps

Heatmaps are a subset of eye-tracking technology that allows researchers to track and analyze where a user's eyes are looking at an object or screen. Heatmaps are also visual representations of data that show where a person's eyes focus when looking at an object, image, or screen. In the context of eye tracking, heatmaps are used to show how often and how long certain areas of an image or screen are viewed by the subject under test (Ghose et al., 2020). By tracking eye movements, the software records how often and how long the user focuses on a particular area. This data is then aggregated and translated into a heatmap, where warmer colors

represent zones of higher focus and cooler colors represent areas of less attention. The creation of a heatmap involves a series of steps. First, during a user study, the software tracks eye movements using specialized hardware such as a webcam or a dedicated eye-tracking device. Second, the software identifies moments where the user's gaze remains focused on a specific point for a specific duration. This is called fixation. Third, the software collects data on fixation location and duration across participants in the study. Fourth, the software compiles the fixation data and translates it into a visual representation. A common heatmap format uses a color gradient, where warmer colors indicate areas with more frequent and longer fixations, and cooler colors represent areas with less attention.

Research Design

This research aims to analyze Generation Z's visual attention to presidential election campaign infographics. This research method involves both quantitative and qualitative approaches. In the quantitative approach, eye tracking technology was used to collect numerical data on where, for how long, and in what order subjects looked at certain areas of the infographic. This data is then analyzed to determine patterns and trends in subjects' visual attention (Lindholm et al., 2021). The qualitative approach involves collecting non-numerical data, such as text, images, and sounds. In the context of this study, the qualitative method involves the use of questionnaires filled out by Generation Z to understand their subjective experiences in response to the presidential election campaign infographics. The results of these questionnaires were then analyzed to gain a deeper understanding of how Generation Z responded to and understood the presidential general election campaign infographics.

Descriptive Method

The population in this study are all students of Prima Indonesia University who belong to Generation Z, defined as individuals born between 1997 and 2012. The selection as the focus of the research was based on their important role in the 2024 presidential election campaign.

Sample

The sample will be randomly selected from Prima Indonesia University's Generation Z student population. To ensure a good representation of the population, the sample will include students from various study programs with the following criteria as Status as Prima Indonesia University students, Belonging to Generation Z, Having participated in the General Election, Having a choice of presidential candidates, Do not have a history of eye disease or currently wearing glasses, Willing to be a research respondent. The number of respondent data taken was 60 people. Once the sample is selected, they will be asked to participate in the online questionnaire survey and eye-tracking recording procedures that are part of this study.

Gaze Recorder

Gaze Recorder is a web-based application that allows researchers to perform eye tracking using a webcam. The app can be used to record eye movements and create a video recording of the activity. With Gaze Recorder, researchers can measure where and how long a person looks at a particular area of an image or video, which is particularly useful in studies on visual attention and consumer behavior. This app is used to record participants' visual attention data during image viewing. The website allows researchers to track participants' eye movements and measure the duration of their focus on a particular area of the image. To ensure accurate eye-tracking data, Gaze Recorder uses a four-step calibration process. First, in the preparation stage, participants are given instructions to place themselves in a bright environment and remove any glasses they may be wearing. This optimizes camera detection for the calibration steps. Secondly, in the Facial Recognition Calibration, users then adjust their head position until the webcam captures their entire face. Upon success, a series of dots appear on the screen, moving sequentially from the center to the top, right, bottom, and left. Users are instructed to follow these dots with their eye and head movements. Third, in Comprehensive Calibration, after completing the initial sequence of dots, a final calibration step refines the tracking accuracy. Here, dots

appear at various angular positions, starting from the top left and moving systematically around the screen. The user's eyes must follow these final dots to ensure proper eye movement tracking throughout the study. Fourth, in Recalibration, if the camera loses sight of the user's face during calibration, the entire process restarts automatically. This protects against inaccurate data due to temporary detection issues. By following these steps, Gaze Recorder establishes a baseline for mapping eye movements to specific locations on the screen, ensuring reliable data collection for your research.

Google Form

Google Form was used to collect participants' biodata and get their opinions after viewing the images. The biodata collected included name, age, gender, and occupation. Participants' opinions on the more interesting areas of the images were obtained through questions compiled in the Google Form.

Webcam

Webcams are an essential component of eye-tracking research, providing the ability to record and analyze eye movements with high precision. The superior image quality of the Logitech Brio 4K webcam ensured that every detail of the eye movements was captured, which is essential for generating accurate data.

Data Processing Procedure

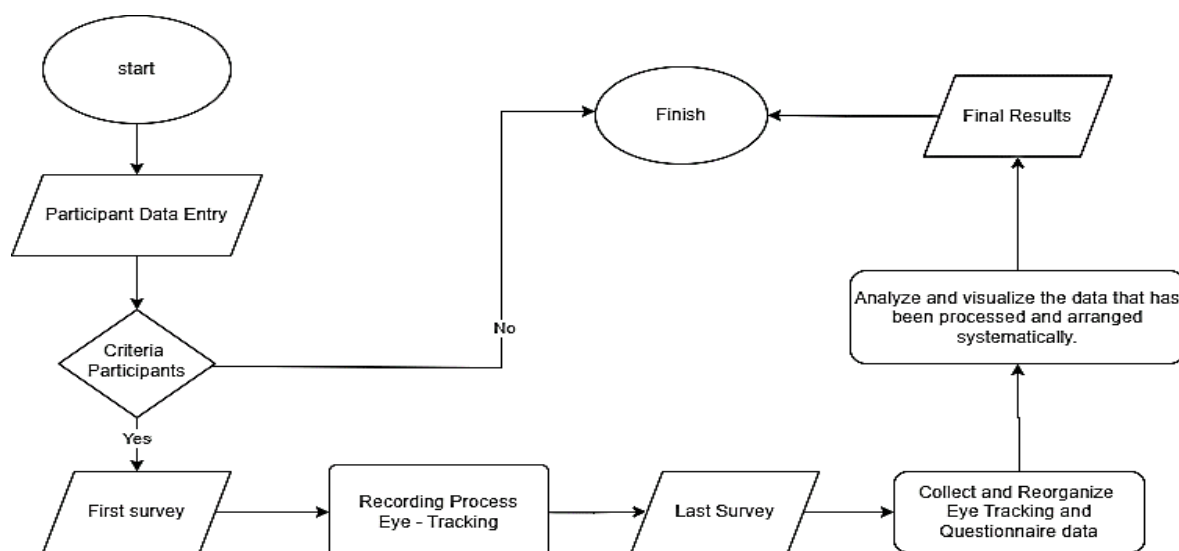


Figure 1. Data Processing Procedure

The stages of the data processing procedure can be seen in the flow chart in Figure 1. Participants were asked to sit facing a computer screen to complete a Google form as the first step in collecting biodata. Participants will fill in some questions about eye health and epilepsy conditions. If the participant has a history of these diseases the form will filter. Participants were asked about the choice of presidential candidate pair chosen at the time of the election. There are 3 choices, namely Supporters of Candidate 1 Anies Baswedan and Muhaimin Iskandar, Supporters of Candidate 2 Prabowo Subianto and Gibran Rakabuming and Supporters of Candidate 3 Ganjar Pranowo and Mahfud MD. They resulted in 3 groups of participants.

Next, Participants will perform eye recording and calibration on the Gaze recorder application. There are 2 different forms of infographics in the form of videos displayed for 40 seconds with periods of 0-14.9 seconds and 15-40 seconds. In the 0-14.9 second period, infographics will be displayed according to the choice at the beginning of filling out the Google form called the questionnaire, and the infographic can be seen in Figure 2. The 15-40 second

period will display the infographic of each candidate or all three candidates simultaneously and the infographic can be seen in Figure 3.



Figure 2. Infographics of candidate number 1 in period 0-14.9 seconds



Figure 3. Infographics of all candidate pairs no. 1, 2, and 3 in period 15-40 seconds

Results and Discussions

Region Of Interest

There are six ROI in the period 0-14.9 seconds, including ROI 1 presidential candidate image, ROI 2 vice presidential candidate image, ROI 3 serial number, ROI 4 candidate pair name, ROI 5 quote, and ROI 6 vision. This can be seen in Figure 4.



Figure 4. Region of Interest (ROI) Candidate Number 1 (a) Candidate Number 2 (b) Candidate Number 3 (c)

Next, there are three ROI in the period 15-40 seconds, including ROI 1 Infographics Candidate Number 1, ROI 2 Infographics Candidate Number 2, and ROI 3 Infographics Candidate Number 3. This can be seen in Figure 5.



Figure 5. Region Of Interest (ROI) in period 0-14.9 seconds

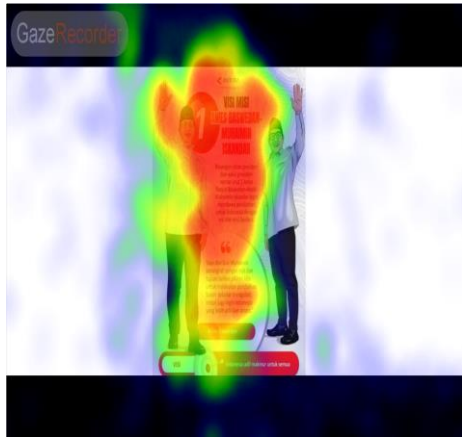
Heatmaps

Figure 6 shows HeatMaps in the period 0-14.9 seconds and 15-40 seconds. The infographics are grouped into 3 groups of participants consisting of 20 participants who voted for candidate pair number 1, 20 voters for candidate pair number 2, and 20 voters for candidate pair number 3.

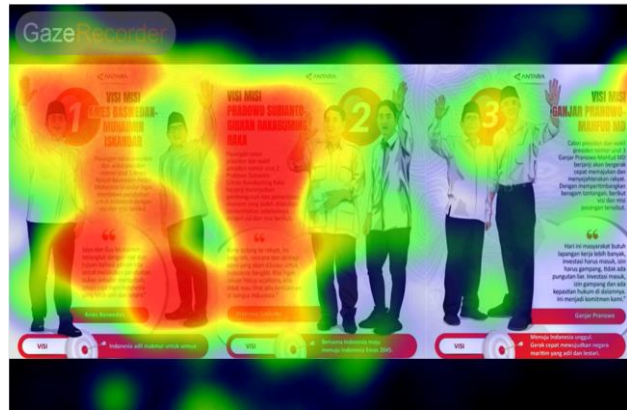
Parameters

Dwell time, also known as fixation duration, refers to the duration for which a user's gaze remains focused on a specific area of an image or screen. It is a crucial metric in eye-tracking

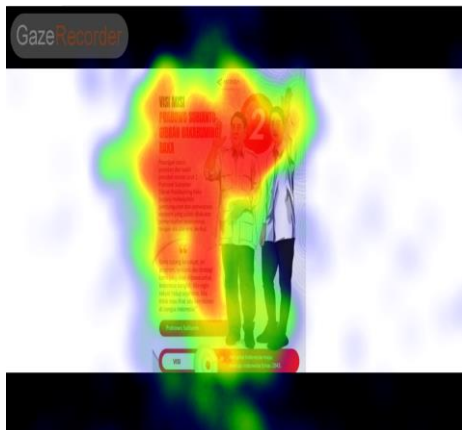
research, providing insights into the level of attention and interest a user devotes to particular elements. Higher dwell times generally indicate greater engagement and focus on those areas.



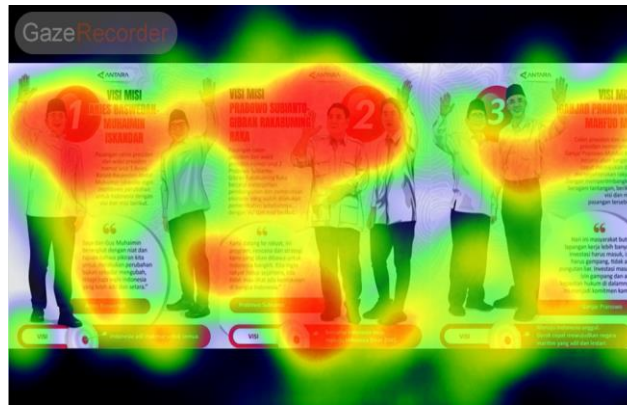
(a)



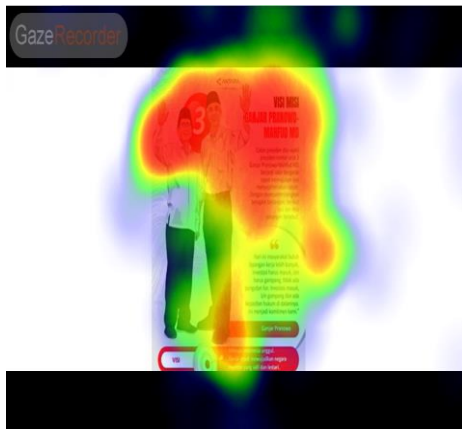
(b)



(c)



(d)



(e)



(f)

Figure 6. HeatMaps of (a) Participants Candidate Number 1 In the period 0-14.9 seconds, (b) Participants Candidate Number 1 in the period 15-40 seconds, (c) Participants Candidate Number 2 In the period 0-14.9 seconds, (d) Participants Candidate Number 2 in the period 15-40 seconds, (e) Participants Candidate Number 3 In the period 0-14.9 seconds, and (f) Participants Candidate Number 3 in the period 15-40 seconds

The first view represents the initial instance when a user's gaze lands on a specific area of the image or screen. It highlights the elements that capture immediate attention upon initial exposure. Analyzing first-view data can reveal which elements users prioritize and where their attention is naturally drawn.

View By provides a more granular breakdown of how users visually explore an image or screen. It tracks the sequence and duration of fixations across the entire viewing period, revealing the path users' eyes take as they navigate the content. This metric offers valuable insights into user engagement patterns and content consumption strategies.

By analyzing these three parameters in conjunction, researchers can gain a holistic understanding of user behavior and attention patterns. Dwell time indicates the depth of engagement, the first view reveals initial points of interest, and view tracks the overall visual exploration journey. Together, these metrics provide a comprehensive picture of how users interact with and perceive visual content. Table from The in period 0s - 14.9s is shown in the Table 1-3.

Table from The in period 0s - 14.9s

Table 1. Analyze the Infographics area of candidate pair 1 with parameters of Dwell Time, First View, and View By from period 0s - 14.9s

Time Period 0s - 14.9s						
Participant Candidate Number 1						
Parameter	Presidential Candidate Image	Vice Presidential Candidate Image	Serial Number	Candidate Pair Name	Quote	Vision
Dwell Time	1.72s	0.68s	0.64s	3.11s	1.74s	0.59s
First View	2.66s	4.62s	1.29s	1.29s	1.39s	4.2s
View By	18	15	20	20	20	16

Table 2. Analyze the Infographics area of candidate pair 2 with parameters of Dwell Time, First View, and View By from period 0s - 14.9s

Time Period 0s - 14.9s						
Participant Candidate Number 2						
Parameter	Presidential Candidate Image	Vice Presidential Candidate Image	Serial Number	Candidate Pair Name	Quote	Vision
Dwell Time	1.91s	0.8s	0.81s	3.16s	1.51s	0.59s
First View	1.35s	5.55s	3.85s	1.52s	4.62s	5.44s
View By	20	16	13	20	18	15

Table 3. Analyze the Infographics area of candidate pair 3 with parameters of Dwell Time, First View, and View By from period 0s - 14.9s

Time Period 0s - 14.9s						
Participant Candidate Number 3						
Parameter	Presidential Candidate Image	Vice Presidential Candidate Image	Serial Number	Candidate Pair Name	Quote	Vision
Dwell Time	1.48s	1.69s	0.53s	3.09s	1.36s	0.55s
First View	1.28s	2.96s	4.19s	2.69s	4.19s	6.1s
View By	19	12	11	20	16	15

Histogram obtained from Gaze Recorder for the period 0s - 14.9 Seconds

Based on the results obtained from the gaze recorder, it produces 3 mapping variables, namely, Dwell Time, First View, and View by. These variables contain seconds and response variables. Seconds represent Dwell Time and First View while responses represent View by.

Histogram of Candidate Number 1 for Time Period 0s - 14.9s

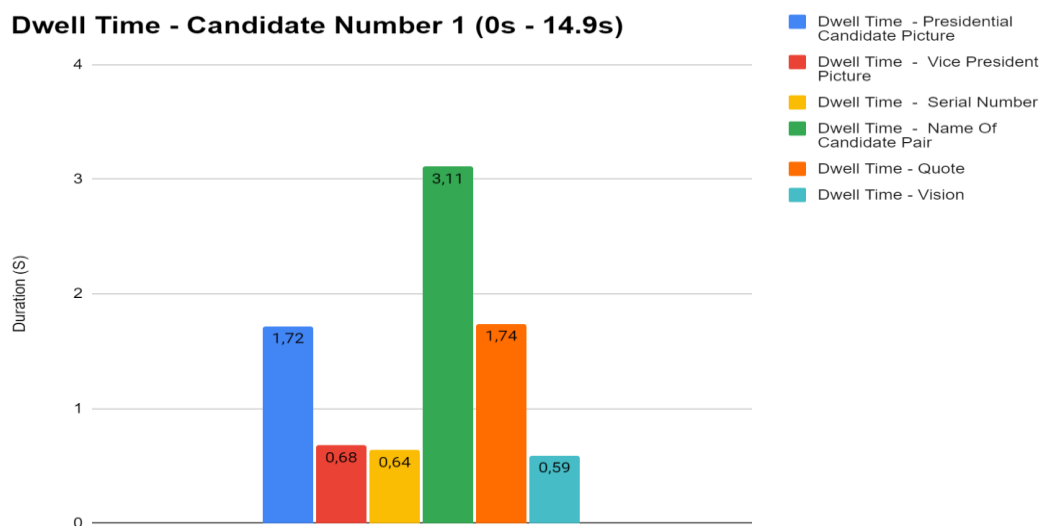


Figure 9. Dwell Time Histogram of Candidate Number 1 for Time Period 0s - 14.9s

Based on Figure 9, participants saw the name of the candidate pair for 3.11s, the quote for 1.74s, the picture of the presidential candidate for 1.72s, the picture for the vice-presidential candidate for 0.68s, the serial number for 0.64s, and the vision for 0.59s.

First View - Candidate Number 1 (0s - 14.9s)

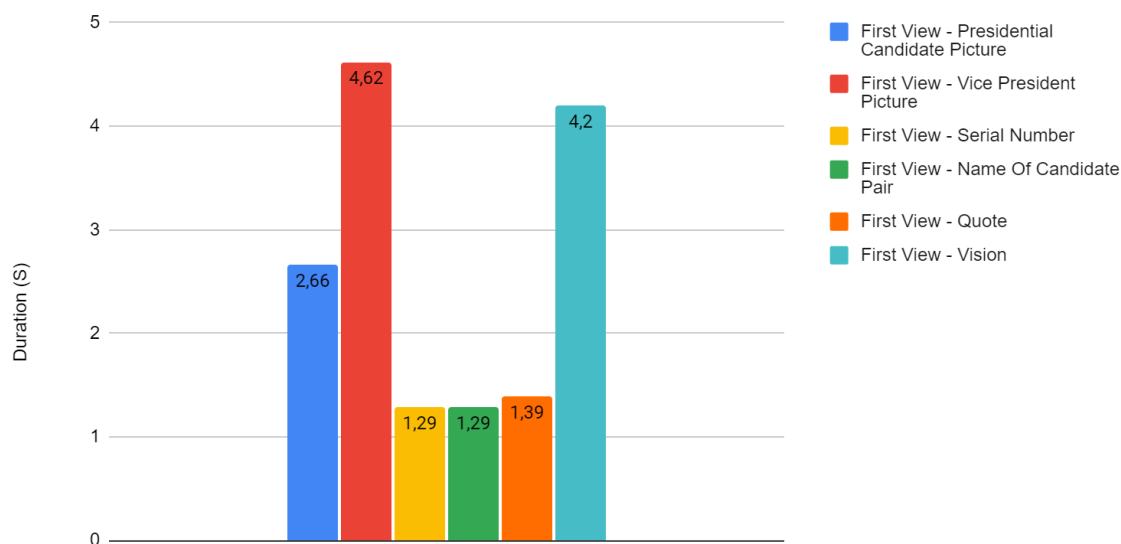


Figure 10. First View Histogram of Candidate Number 1 for Time Period 0s - 14.9s

Based on Figure 10, participants saw the serial number and the name of the candidate

pair at 1.29s, the quote at 1.39s, the picture of the presidential candidate at 2.66s, the vision at 4.2s, the picture for the vice-presidential candidate at 4.62s.

View By - Candidate Number 1 (0s - 14.9s)

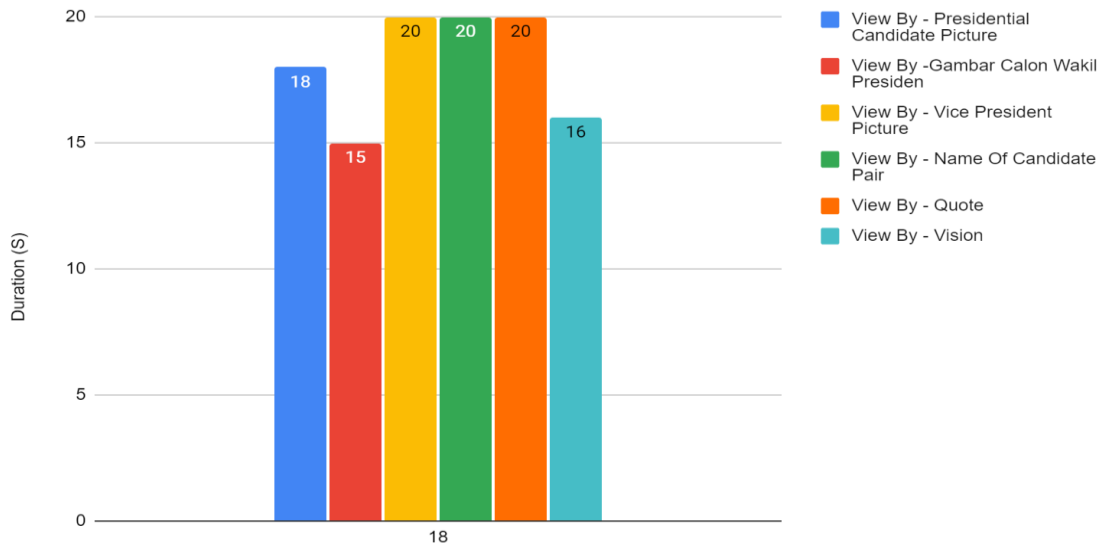


Figure 11. First View Histogram of Candidate Number 1 for Time Period 0s - 14.9s

PERCENTAGE OF THE MOST DOMINANT PART OF THE VISUAL AREA SEEN BY PARTICIPANTS OF CANDIDATE NUMBER 1 (N=20)

Data obtained from Gaze Recorder

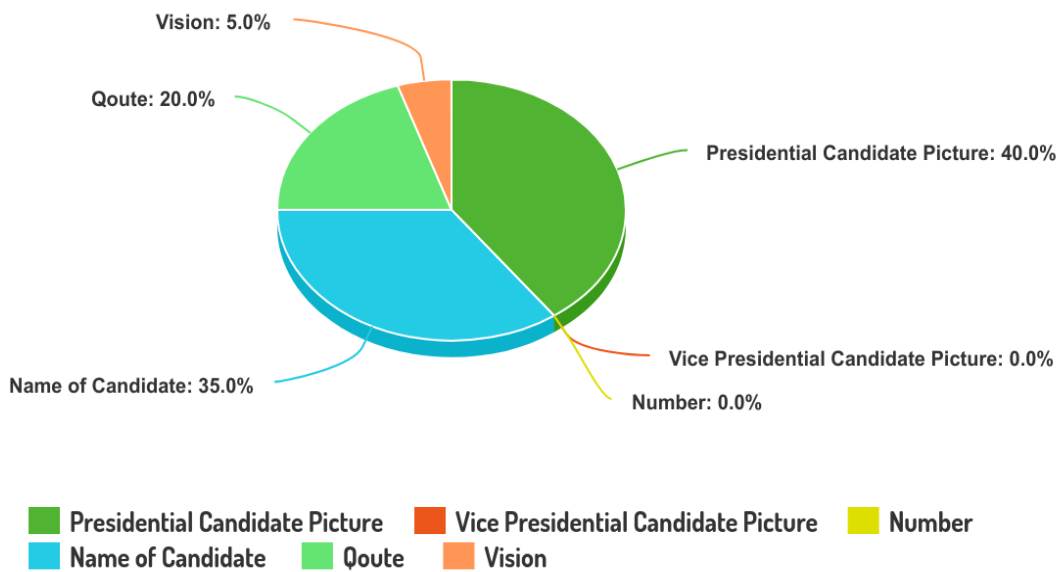


Figure 12. Percentage Chart of Infographics Interesting Areas for Candidate Number 1

Based on Figure 11, the serial number, the name of the candidate pair and quote was viewed by 20 participants, the picture of the presidential candidate was viewed by 18 participants, the vision was viewed by 16 participants and the picture of the vice-presidential candidate was viewed by 15 participants.

From Figure 12, it is a summary of Figures 9, 10, 11 where it can be seen that 40% of all participants were interested in the visual area of the Presidential Candidate's Image, 35% in the Name of the Candidate Pair, 20% in the Quote, 5% in the Vision and 0% in the Representative Candidate Image President and Serial Number.

Histogram of Candidate Number 2 for Time Period 0s - 14.9s

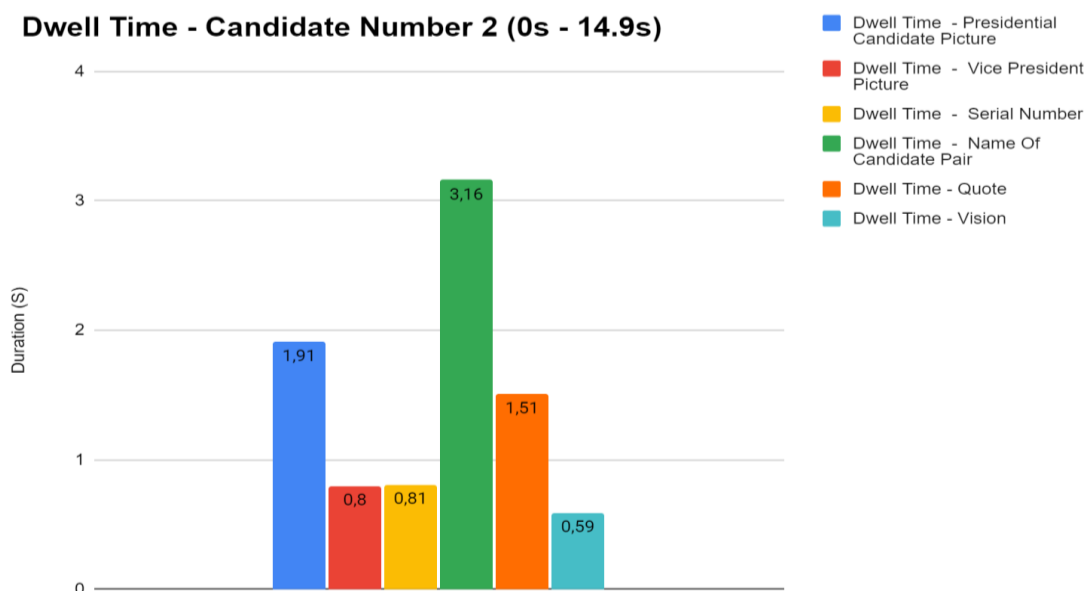


Figure 13. Dwell Time Histogram of Candidate Number 2 for Time Period 0s - 14.9s

First View - Candidate Number 2 (0s - 14.9s)

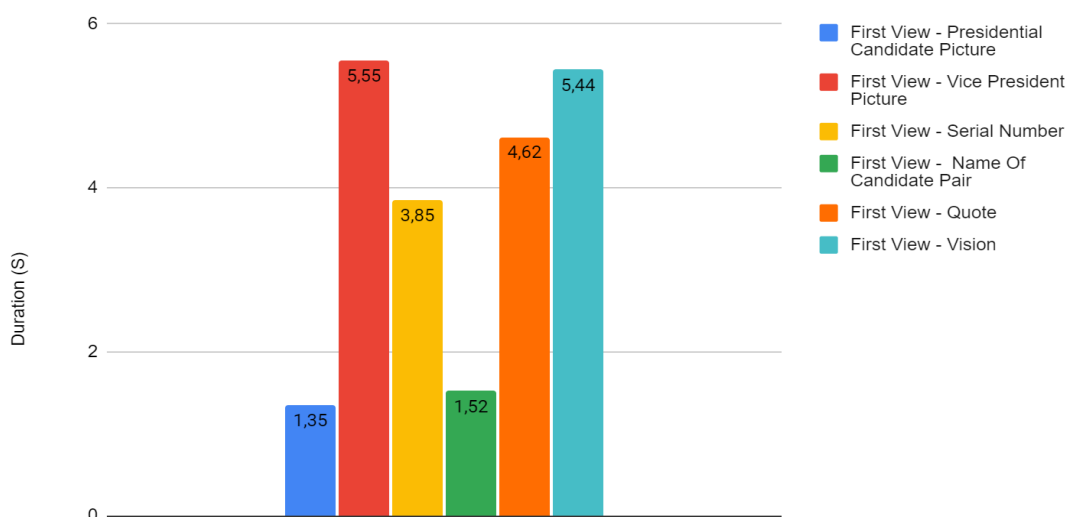


Figure 14. First View Histogram of Candidate Number 2 for Time Period 0s - 14.9s

Based on Figure 13, participants saw the name of the candidate pair for 3.16s, the picture of the presidential candidate for 1.91s, the quote for 1.51s, the picture for the vice presidential candidate and the serial number for 0.81s, and the vision for 0.59s.

Based on Figure 14, participants saw the picture of the presidential candidate at 1.35s, the name of the candidate pair at 1.52s, the serial number at 3.85s, the quote at 4.62s, the vision at 5.44s, the picture for the vice-presidential candidate at 5.55s.

View By - Candidate Number 2 (0s - 14.9s)

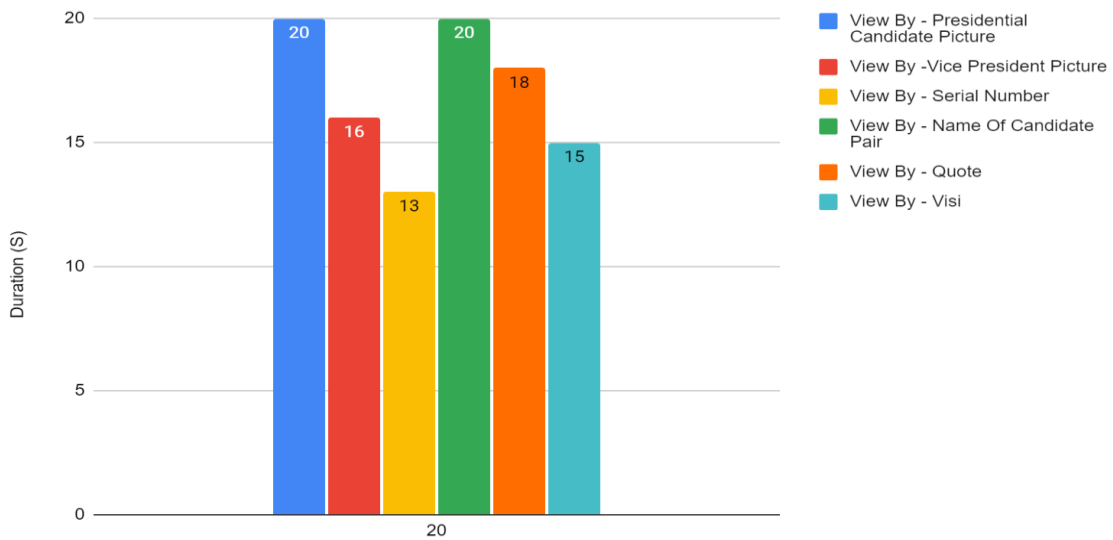


Figure 15. First View Histogram of Candidate Number 2 for Time Period 0s - 14.9s

PERCENTAGE OF THE MOST DOMINANT PART OF THE VISUAL AREA SEEN BY PARTICIPANTS OF CANDIDATE NUMBER 2 (N=20)

Data obtained from Gaze Recorder

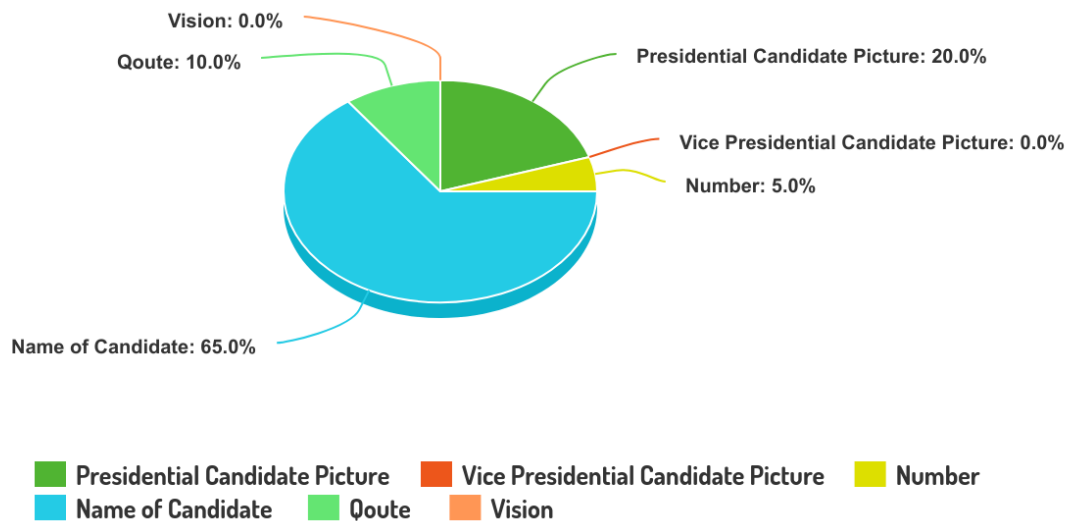


Figure 16. Percentage Chart of Infographics Interesting Areas for Candidate Number 2

Based on Figure 15, the picture of the presidential candidate was viewed by 20 participants, the quote was viewed by 18 participants, the picture of the vice-presidential candidate was viewed by 16 participants, the vision was viewed by 15 participants and the serial number was viewed by 13 participants.

From Figure 16, it is a summary of Figures 13, 14, 15 where it can be seen that 61.9% of all participants were interested in the visual area of the Candidate Pair's Name, 19% in the Image of the Presidential Candidate, 14.3% in the Quote, 4.8% in the Serial Number area and 0% in the Image of the Vice-Presidential Candidate and Vision.

Histogram of Candidate Number 3 for Time Period 0s - 14.9s

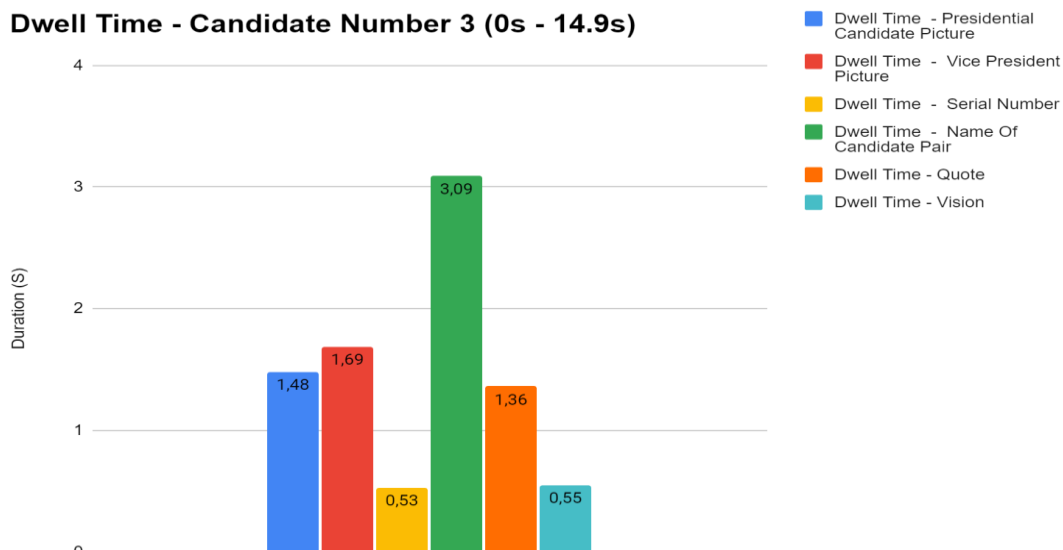


Figure 17. Dwell Time Histogram of Candidate Number 3 for Time Period 0s - 14.9s

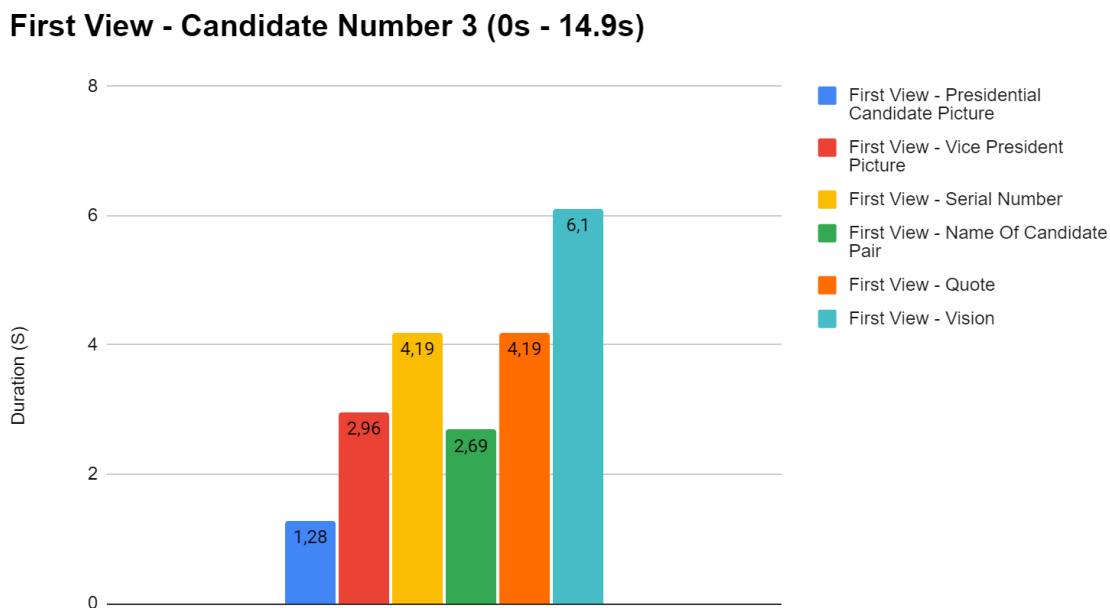


Figure 18. First View Histogram of Candidate Number 3 for Time Period 0s - 14.9s

Based on Figure 17, participants saw the name of the candidate pair for 3.09s, the picture for the vice presidential candidate for 1.69s, the picture of the presidential candidate

for 1.48s, the quote for 1.36s, the vision for 0.55s and the serial number for 0.53s.

Based on Figure 18, participants saw the picture of the presidential candidate at 1.28s, the name of the candidate pair at 2.69s, the picture for the vice-presidential candidate at 2.96s, the quote and the serial number at 4.19s, and the vision at 6.1s.

View By - Candidate Number 3 (0s - 14.9s)

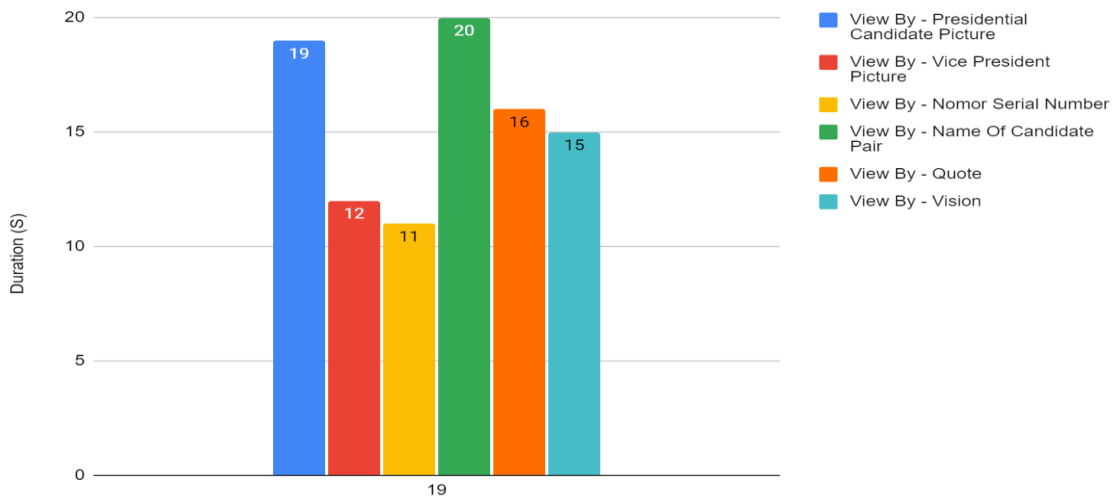


Figure 19. First View Histogram of Candidate Number 3 for Time Period 0s - 14.9s

Based on Figure 19, the name of the candidate pair was viewed by 20 participants, the picture of the presidential candidate was viewed by 19 participants, the quote was viewed by 16 participants, the vision was viewed by 15 participants, the picture of the vice-presidential candidate was viewed by 12 participants and the serial number was viewed by 11 participants.

PERCENTAGE OF THE MOST DOMINANT PART OF THE VISUAL AREA SEEN BY PARTICIPANTS OF CANDIDATE NUMBER 3 (N=20)

Data obtained from Gaze Recorder

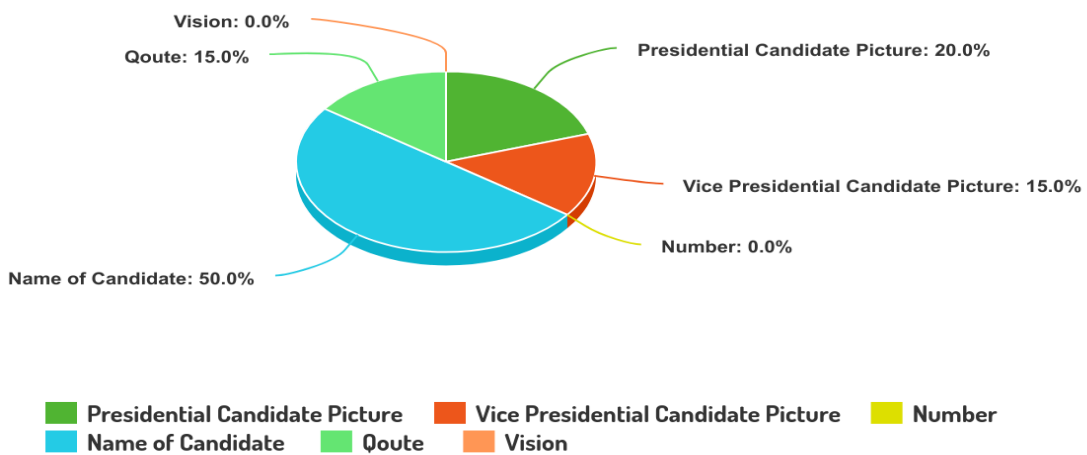


Figure 20. Percentage Chart of Infographics Interesting Areas for Candidate Number 3

From Figure 20, it is a summary of Figures 17, 18, 19 where it can be seen that 50% of all participants were interested in the visual area of the Name of the Candidate, 20% in the Image of the Presidential Candidate, 15% in the Image of the Vice-Presidential Candidate and

Quote, and 0% in the Serial Number and Vision.

Table from The Period 15s - 40s

Table 4. Analyzing all infographics from candidate pair 1 participants with Dwell Time, First View, and View By parameters from the period 15s - 40s

Parameter	Time Period 15s - 40s Participant Candidate Number 1		
	Infographics Candidate Number 1	Infographics Candidate Number 2	Infographics Candidate Number 3
Dwell Time	10.08s	7.62s	2.82s
First View	16.46s	15.58s	23.08s
View By	20	20	16

Table 5. Analyzing all infographics from candidate pair 2 participants with Dwell Time, First View, and View By parameters from the period 15s - 40s

Parameter	Time Period 15s - 40s Participant Candidate Number 2		
	Infographics Candidate Number 1	Infographics Candidate Number 2	Infographics Candidate Number 3
Dwell Time	6.03s	9.6s	5.82s
First View	16.26s	15.13s	18.98s
View By	18	20	20

Table 6. Analyzing all infographics from candidate pair 3 participants with Dwell Time, First View, and View By parameters from the period 15s - 40s

Parameter	Time Period 15s - 40s Participant Candidate Number 3		
	Infographics Candidate Number 1	Infographics Candidate Number 2	Infographics Candidate Number 3
Dwell Time	3.34s	4.74s	9.88s
First View	16.8s	15.31s	17.34s
View By	16	19	20

Histogram obtained from Gaze Recorder for the period 15-40 Seconds

Based on the results obtained from the gaze recorder, it produces 3 mapping variables, namely, Dwell Time, First View, and View by. These variables contain seconds and response variables. Seconds represent Dwell Time and First View while responses represent View by.

Histogram of Candidate Number 1 for Time Period 15s - 40s

Dwell Time - Candidate Number 1 (15s - 40s)

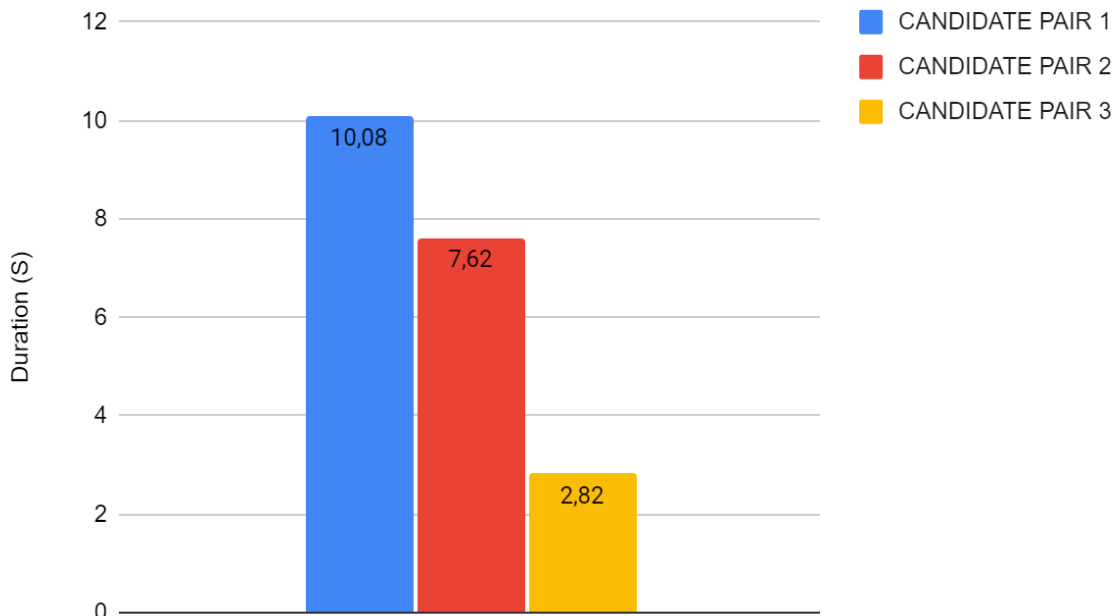


Figure 21. Dwell Time Histogram of Candidate Number 1 for Time Period 15s - 40s

Based on Figure 21, participants saw the infographics of the candidate pair number 1 for 10.08s, the candidates pair number 2 for 7.62s and the candidates pair number 3 for 2,82s.

First View - Candidate Number 1 (15s - 40s)

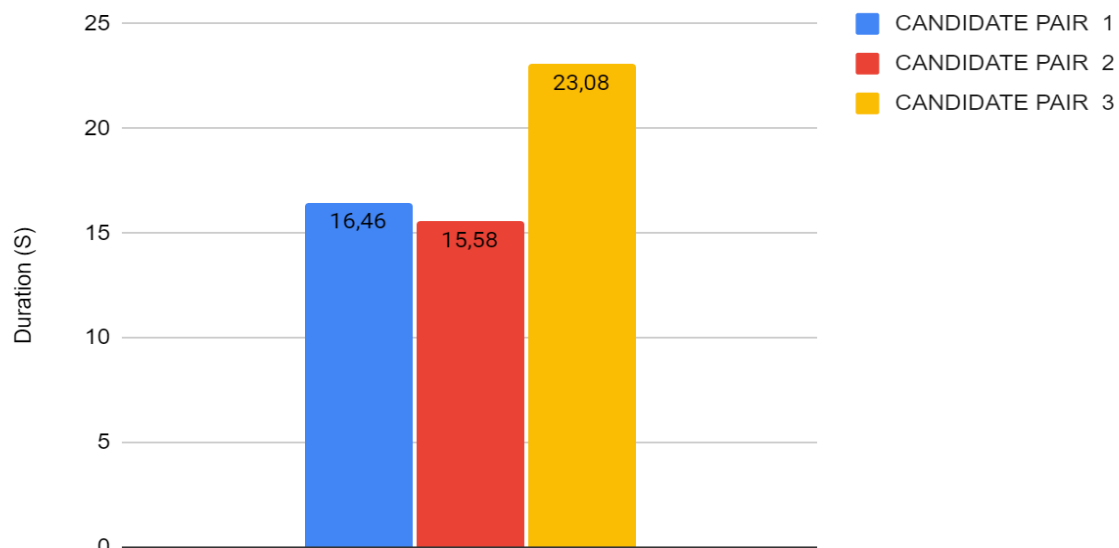


Figure 22. First View Histogram of Candidate Number 1 for Time Period 15s - 40s

Based on Figure 22, participants saw the infographics of the candidate pair number 2 at 15.58s, the candidates number 1 at 16.46s and the candidates number 3 at 23.08s.

View By - Candidate Number 1 (15s - 40s)

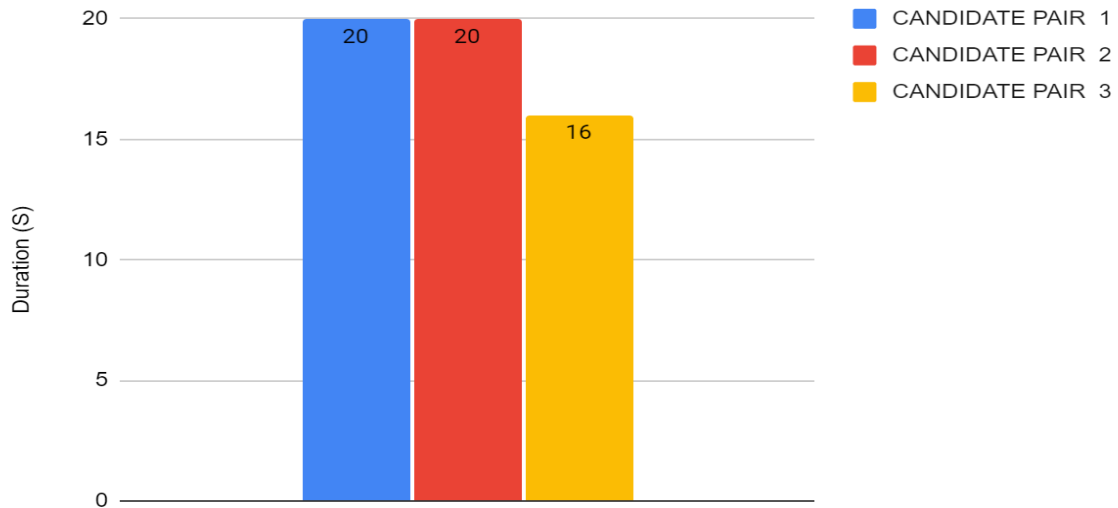


Figure 23. First View Histogram of Candidate Number 1 for Time Period 15s - 40s

Based on Figure 23, the infographics of the candidate pair number 1 and 2 was viewed by 20 participants, and the candidates pair number 3 was viewed by 16 participants.

This study will also show consistent or inconsistent choices at the beginning of the questionnaire and when the three infographic images of each candidate pair are displayed. These results are obtained based on questionnaire data and gaze recorder data, namely Dwell Time. The table below shows the results per group with the parameters of initial candidate choice, ROI and Dwell Time for the time period of 15-40 seconds.

Table 7. Analyze the infographics of Candidate Group 1 using the parameters of all participants based on their initial choice of candidate, 3 Region Of Interest (ROI) and Dwell Time Value over a time period of 15 seconds to 40 seconds.

Time Period 15s - 40s Participant Candidate Number 1			
Participant	Initial Choice	Region Of Interest	Dwell Time
P1	Candidate Number 1	Candidate Number 1	11.83s
P2	Candidate Number 1	Candidate Number 2	9.3s
P3	Candidate Number 1	Candidate Number 1	9.27s
P4	Candidate Number 1	Candidate Number 1	11.72s
P5	Candidate Number 1	Candidate Number 2	9.89s
P6	Candidate Number 1	Candidate Number 1	11.73s
P7	Candidate Number 1	Candidate Number 1	10.16s
P8	Candidate Number 1	Candidate Number 1	17.54s
P9	Candidate Number 1	Candidate Number 2	5.27s
P10	Candidate Number 1	Candidate Number 2	13.22s
P11	Candidate Number 1	Candidate Number 2	11.77s

P12	Candidate Number 1	Candidate Number 2	10.11s
P13	Candidate Number 1	Candidate Number 2	10.11s
P14	Candidate Number 1	Candidate Number 2	11.84s
P15	Candidate Number 1	Candidate Number 1	16.56s
P16	Candidate Number 1	Candidate Number 1	16.8s
P17	Candidate Number 1	Candidate Number 2	13.34s
P18	Candidate Number 1	Candidate Number 2	9.42s
P19	Candidate Number 1	Candidate Number 1	15.35s
P20	Candidate Number 1	Candidate Number 1	8.02s

Based on Table 7, it is found that all participants of candidate pair number 1 had 10 participants who were consistent in their choice at the beginning, and 10 participants who were inconsistent in their choice.

PERCENTAGE OF CANDIDATE PARTICIPANT NUMBER 1 CONSISTENT IN HIS INITIAL CHOICE AND INCONSISTENT WHEN PRESENTED WITH A COMBINATION OF THE THREE IMAGES

Data obtained from Gaze Recorder

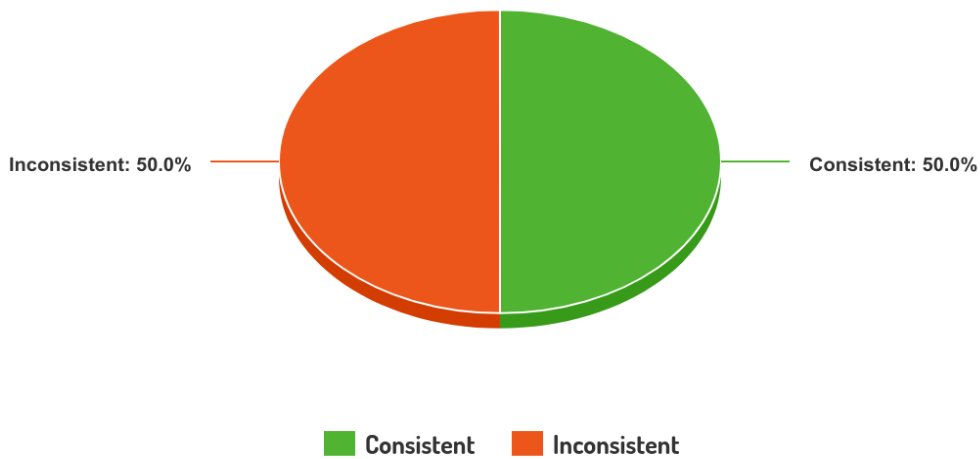


Figure 24. Participant Consistency Chart for Candidate Pair Number 1

From Figure 24 above, it is a summary of Table 7 where it can be seen that 50% of all participants were consistent in their choices and the other 50% were inconsistent.

Histogram of Candidate Number 2 for Time Period 15s - 40s

Dwell Time Candidate Number 2 (15s - 40s)

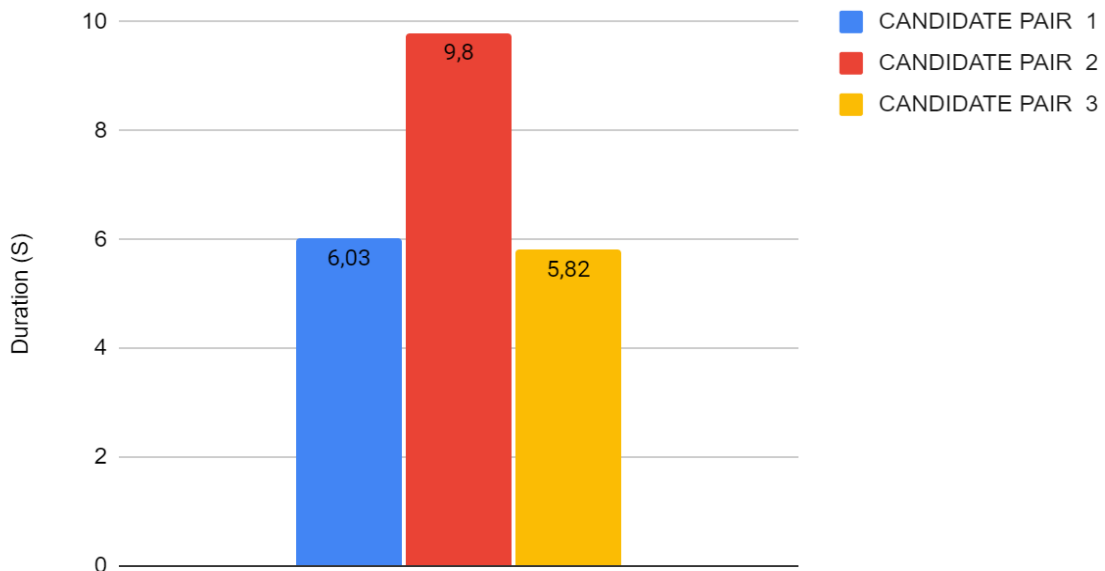


Figure 25. Dwell Time Histogram of Candidate Number 2 for Time Period 15s - 40s

Based on Figure 25, participants saw the infographics of the candidate pair number 2 for 9.8s, the candidates pair number 1 for 6.03s and the candidates pair number 3 for 5,82s.

First View - Candidate Number 2 (15s - 40s)

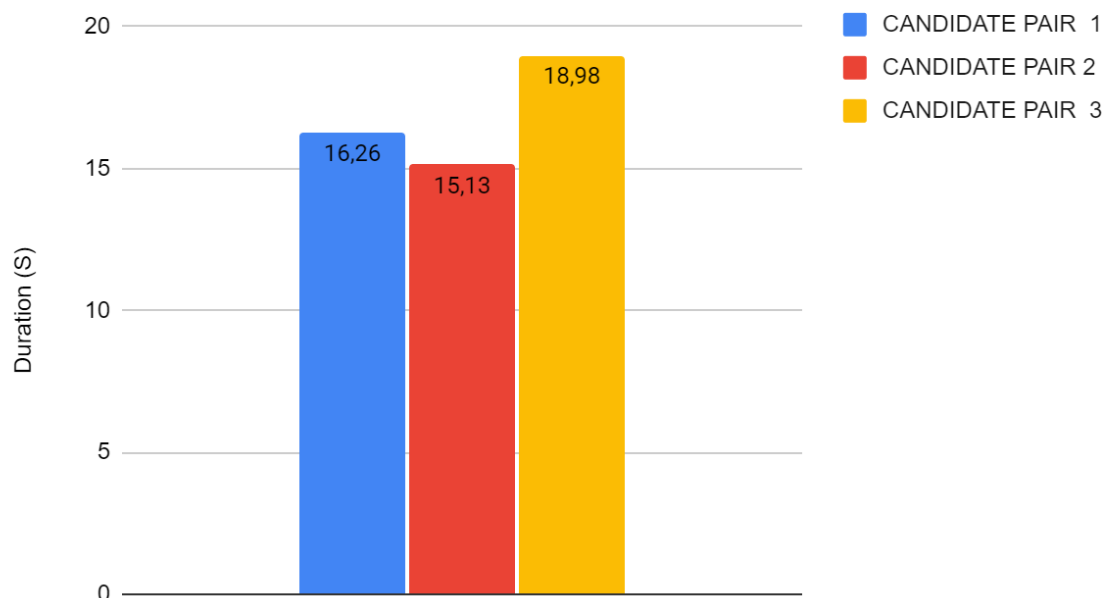


Figure 26. First View Histogram of Candidate Number 2 for Time Period 15s - 40s

Based on Figure 26, participants saw the infographics of the candidates pair number 2 at 15.13s, the candidates number 1 at 16.26s and the candidates number 3 at 18.98s.

View By - Candidate Number 2 (15s - 40s)

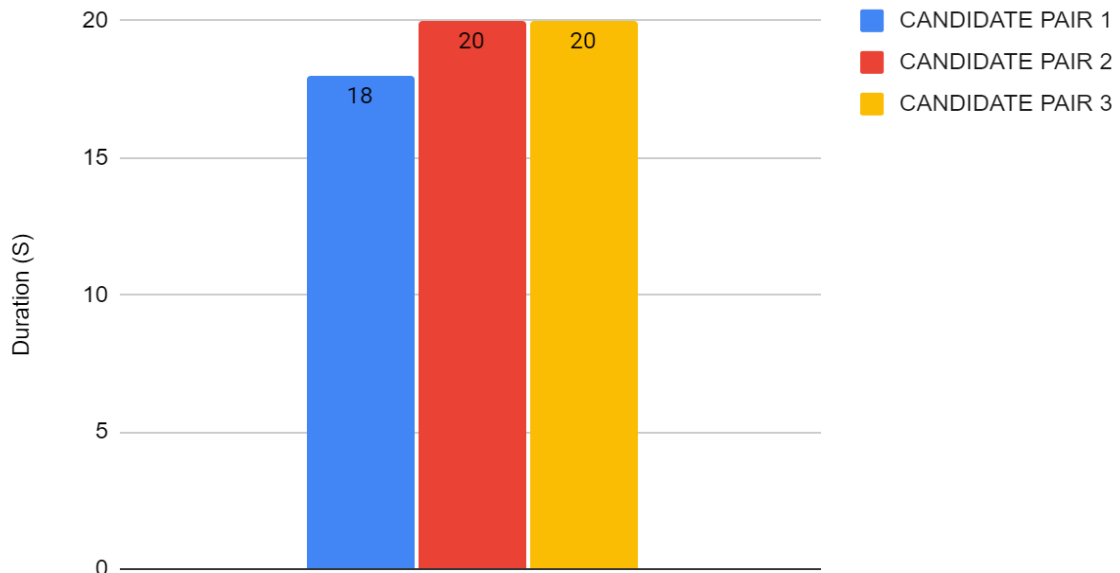


Figure 27. First View Histogram of Candidate Number 2 for Time Period 15s - 40s

Based on Figure 27, the infographics of the candidate pair number 2 and 3 was viewed by 20 participants, and the candidates pair number 1 was viewed by 18 participants.

Table 8. Analyze the infographics of Candidate Group 2 using the parameters of all participants based on their initial choice of candidate, 3 Region Of Interest (ROI) and Dwell Time Value over a time period of 15 seconds to 40 seconds.

Time Period 15s - 40s Participant Candidate Number 2			
Participant	Initial Choice	Region Of Interest	Dwell Time
P1	Candidate Number 2	Candidate Number 1	9.06s
P2	Candidate Number 2	Candidate Number 1	9.94s
P3	Candidate Number 2	Candidate Number 2	7.02s
P4	Candidate Number 2	Candidate Number 2	19.94s
P5	Candidate Number 2	Candidate Number 1	10.24s
P6	Candidate Number 2	Candidate Number 2	14.42s
P7	Candidate Number 2	Candidate Number 2	11.09s
P8	Candidate Number 2	Candidate Number 2	21.65s
P9	Candidate Number 2	Candidate Number 1	13.45s
P10	Candidate Number 2	Candidate Number 1	13.45s
P11	Candidate Number 2	Candidate Number 2	12.43s
P12	Candidate Number 2	Candidate Number 1	8.82s
P13	Candidate Number 2	Candidate Number 1	10.83s

P14	Candidate Number 2	Candidate Number 2	14.17s
P15	Candidate Number 2	Candidate Number 2	16.65s
P16	Candidate Number 2	Candidate Number 1	4.42s
P17	Candidate Number 2	Candidate Number 2	11.98s
P18	Candidate Number 2	Candidate Number 1	9.34s
P19	Candidate Number 2	Candidate Number 2	9.01s
P20	Candidate Number 2	Candidate Number 2	10.76s

Based on Table 8, it is found that all participants of candidate pair number 2 had 11 participants who were consistent in their choice at the beginning, and 9 participant who were inconsistent in their choice.

PERCENTAGE OF CANDIDATE PARTICIPANT NUMBER 2 CONSISTENT IN HIS INITIAL CHOICE AND INCONSISTENT WHEN PRESENTED WITH A COMBINATION OF THE THREE IMAGES

Data obtained from Gaze Recorder

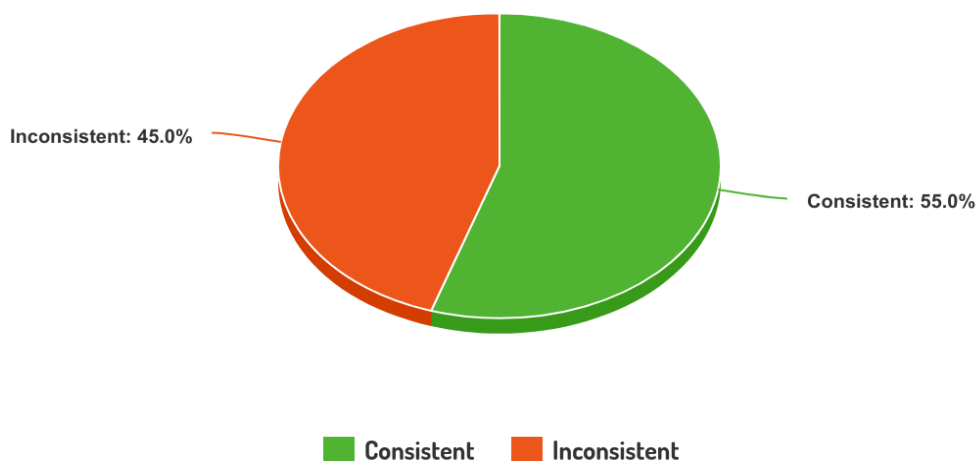


Figure 28. Participant Consistency Chart for Candidate Pair Number 2

From Figure 28 above, it is a summary of Table 8 where it can be seen that 45% of all participants were consistent in their choices and the other 55% were inconsistent.

Histogram of Candidate Number 3 for Time Period 15s - 40s

Dwell Time Candidate Number 3 (15s - 40s)

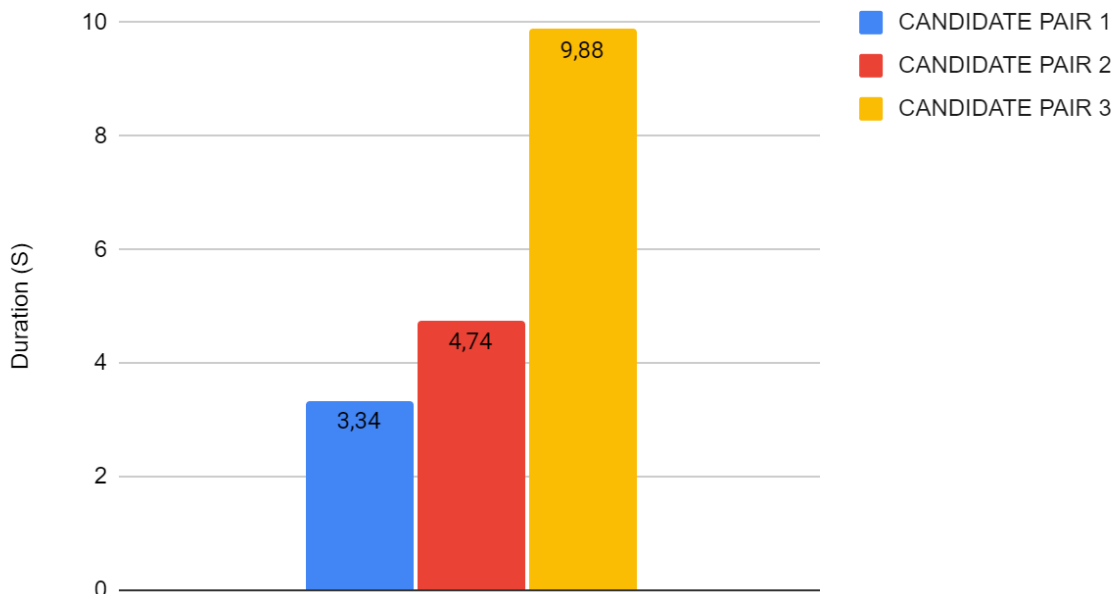


Figure 29. Dwell Time Histogram of Candidate Number 3 for Time Period 15s - 40s

Based on Figure 29, participants saw the infographics of the candidate pair number 3 for 9.88s, the candidates pair number 2 for 4.74s and the candidates pair number 3 for 3.34s.

First View - Candidate Number 3 (15s - 40s)

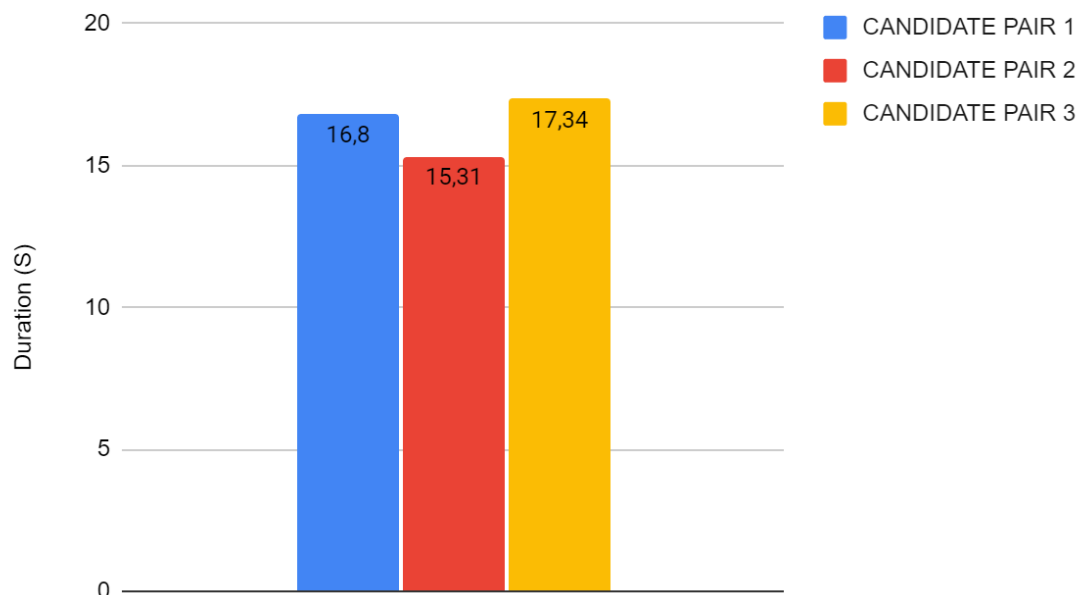


Figure 30. First View Histogram of Candidate Number 3 for Time Period 15s - 40s

Based on Figure 30, participants saw the infographics of the candidate pair number 2 at 15.31s, the candidates number 1 at 16.8s and the candidates number 3 at 17.34s.

View By - Candidate Number 3 (15s - 40s)

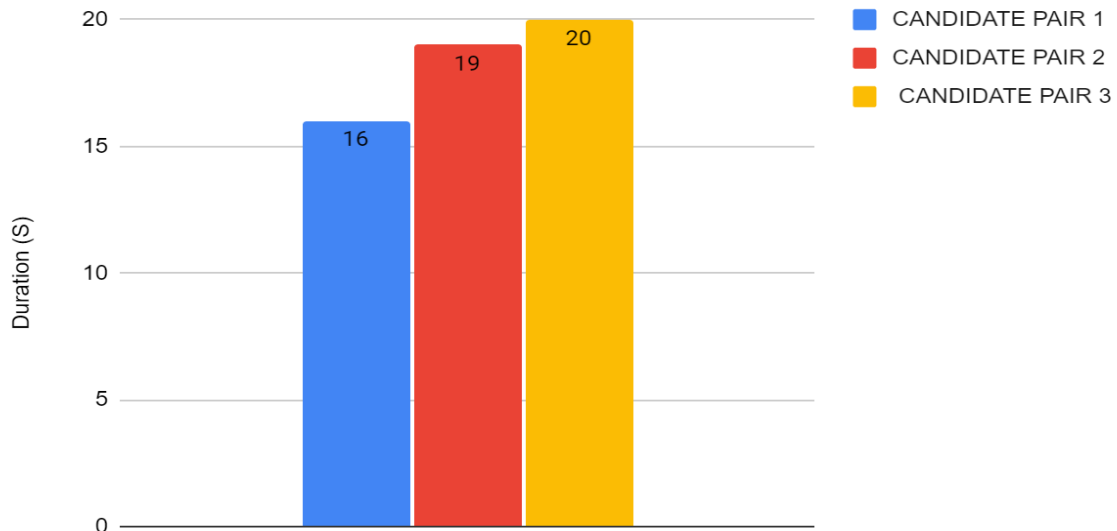


Figure 31. First View Histogram of Candidate Number 3 for Time Period 15s - 40s

Based on Figure 31, the infographics of the candidate pair number 3 was viewed by 20 participants, the candidates pair number 2 was viewed by 19 participants and the candidates pair number 1 was viewed by 16 participants.

Table 9. Analyze the infographics of Candidate Group 3 using the parameters of all participants based on their initial choice of candidate, 3 Region Of Interest (ROI) and Dwell Time Value over a time period of 15 seconds to 40 seconds.

Participant	Time Period 15s - 40s Participant Candidate Number 3		
	Initial Choice	Region Of Interest	Dwell Time
P1	Candidate Number 3	Candidate Number 1	7.55s
P2	Candidate Number 3	Candidate Number 2	7.21s
P3	Candidate Number 3	Candidate Number 3	8.27s
P4	Candidate Number 3	Candidate Number 3	10.76s
P5	Candidate Number 3	Candidate Number 2	12.13s
P6	Candidate Number 3	Candidate Number 2	10.73s
P7	Candidate Number 3	Candidate Number 3	8.72s
P8	Candidate Number 3	Candidate Number 3	7.9s
P9	Candidate Number 3	Candidate Number 1	9.17s
P10	Candidate Number 3	Candidate Number 2	3.81s
P11	Candidate Number 3	Candidate Number 3	14.31s
P12	Candidate Number 3	Candidate Number 3	12.49s
P13	Candidate Number 3	Candidate Number 2	8.73s

P14	Candidate Number 3	Candidate Number 3	22.26s
P15	Candidate Number 3	Candidate Number 3	12.75s
P16	Candidate Number 3	Candidate Number 3	22.05s
P17	Candidate Number 3	Candidate Number 2	5.87s
P18	Candidate Number 3	Candidate Number 3	16.99s
P19	Candidate Number 3	Candidate Number 3	18.93s
P20	Candidate Number 3	Candidate Number 3	10.84s

Based on Table 9, it is found that all participants of candidate pair number 3 had 12 participants who were consistent in their choice at the beginning, and 8 participant who were inconsistent in their choice.

PERCENTAGE OF CANDIDATE PARTICIPANT NUMBER 3 CONSISTENT IN HIS INITIAL CHOICE AND INCONSISTENT WHEN PRESENTED WITH A COMBINATION OF THE THREE IMAGES

Data obtained from Gaze Recorder

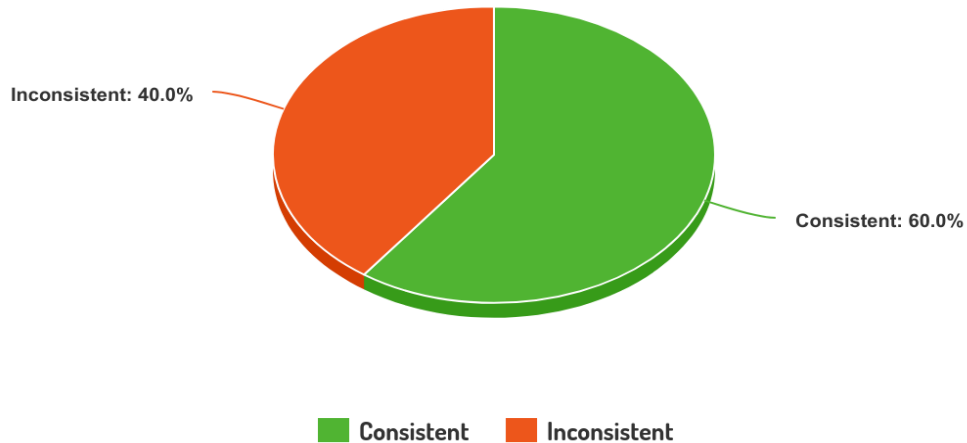


Figure 32. Participant Consistency Chart for Candidate Pair Number 3

From Figure 32 above, it is a summary of Figures 29, 30, 31 where it can be seen that 60% of all participants were consistent in their choices and the other 40% were inconsistent.

Conclusions

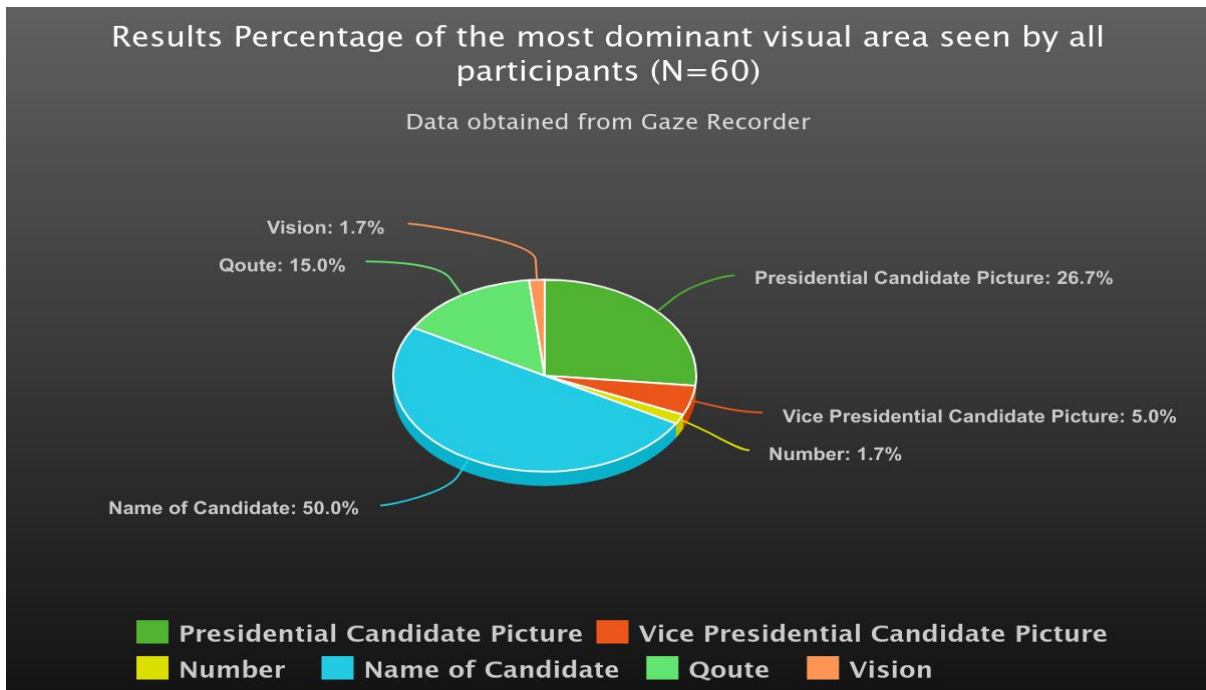


Figure 33. Percentage Chart of Visually Attractive Areas from All Participant

According to the research results that have been summarized, it can be concluded that in Figure 33 there are 50% of participants seeing the Name of the Candidate Pair, 27% seeing the Picture of the Presidential Candidate, 15% seeing the Quote, 5% seeing the Picture of the Vice-Presidential Candidate, 2% seeing the Serial Number and 1% seeing Vision.

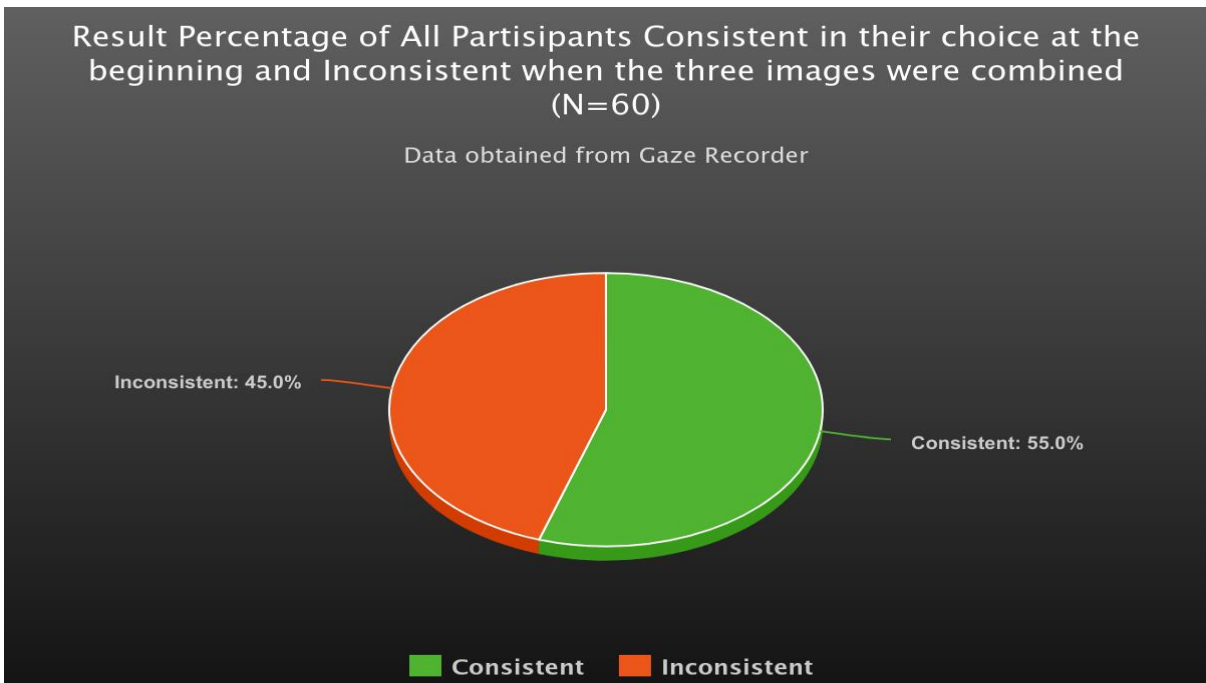


Figure 34. Consistency Chart of All Participants from The Three Candidate Pairs

In Figure 34, there are 55% of participants (33 out of 60 participants) consistently look at the infographic according to the selected candidate pair from the start of the eye recording to the end of the eye recording, 45% of participants (27 out of 60 participants) are inconsistent in seeing the infographic according to the selected candidate pair.

Discussion

In closing, this research offers an in-depth understanding of Generation Z's visual attention to presidential election campaign infographics using Eye-Tracking technology. The results of the analysis show that the name of the candidate pair is the most dominant visual area seen by all participants when viewing the infographic for the period 0-14.9 seconds. This shows that 3 groups of participants saw the names of the candidate pairs written on the infographic displayed. Furthermore, the consistency of young voters when shown three candidate pair pictures simultaneously for 15-40 seconds was consistent with their choices even though three candidate pair pictures were shown. This research makes a significant contribution to the presidential election to develop appropriate political campaign strategies for Generation Z in the upcoming general election.

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Conflicts of interest

The authors assert no conflicts of interest related to this research. We confirm that our work has been carried out impartially and without bias, and we do not have any financial or personal affiliations that could impact the objectivity of our findings or the interpretation of the results.

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