



The remote work, the implementation of a sustainability protocol to observe or not, changes in people’s behavior

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ABSTRACT

Classified as distance work, remote work is a modality that has existed for a long time and some companies adopt this form of work for many reasons, among which we can point out functional well-being, mobility, productivity, etc. The adoption of remote work was on the rise, and with the advent of Covid-19, due to the need for social isolation, many companies and employees immediately and urgently adopted remote work. These people began to carry out their daily activities in a far from traditional environment and, for the most part, in their own homes. In this case, this sudden change may have occurred without any type of preparation or guidance regarding sustainability. People have adapted to the existing conditions to be able to live with the difficulties presented in the scenario. The objective of this work is to verify the change in people's behavior, based on the application of an environmental sustainability protocol in remote work. This result will demonstrate the importance of having a protocol or periodic guidance material, with the aim of raising employee awareness, so that these people can implement sustainable practices in their daily work when working remotely.

Keywords: Remote work, sustainability and protocol.

1. INTRODUCTION

From remote times to the current days, human beings live in constant evolution, through daily living, experiences and knowledge, thus acquiring skills to use available resources in each era, in order to survive the adversities and challenges present in different scenarios. (ALVES, 2019).

Humanity kept evolving, therewith, significant changes occurred in the human relationships and with the world around them. Therefore, groups, tribes, civilizations and societies who produced for subsistence were formed, but, reaching the current moment, as a result of several factors, industries with mass production emerged to meet demand that increases day after day (LEFF, 2003).

The increase in demand and human evolution brought new ideas, creations, inventions that over time were transformed until they reach the technologies we know. The New technologies and the industry evolution have reached the social nature, thus emerging new ways of working in companies, thinking about factors such as functional well-being. This is how remote work arises, a modality that allows employees to have mobility, by carrying out their activities and maintaining productivity, being disconnected from the conventional work environment in which they work (DA SILVA, 2009).

However, with new technologies and rising demand, the large-scale production causes constant human interventions on the planet, which alters its natural conditions, a factor that can generate an imbalance and various problems in many parts of the globe, such as: climate change, extinction of fauna and flora species, high waste generation, natural resources scarcity, etc. (ALVES, 2019).

Facing the large-scale production, and all the consequences arising from these actions, organizations need to be aware of their responsibility in relation to the impacts that their activities cause. This knowledge is vastly valuable, so that with this understanding, new, more efficient and sustainable solutions and technologies can be implemented, to be executed throughout the organization (BARBOSA; LOPES, 2018).

By this process, concerned organizations about the impact they cause, carry out training and implement practices with the aim of raising awareness among the conglomerate's employees (SAPIENZA; PANDOLFI, 2019).

According to DA SILVA (2009), remote work was rising, but it did not yet exist on a large scale. The reality presented by Covid-19 caused workers' routines to change due to the need for social distancing, as employees, who until then worked face-to-face, had to quickly adapt to remote work (CAMPOS, 2021).

Raising awareness among companies and their employees is crucial to understand the caused impacts, in order to initiate a change in behavior, applying sustainable practices to everyday work processes and life style. In this context, a question arises: what will be the effect of implementing a sustainability protocol for workers who work remotely?

2. GENERAL OBJECTIVE

Analyzing the effect of implementing a sustainability protocol for workers who work remotely, verifying the occurrence of behavior changes of those surveyed in response to the sustainability issues raised.

3. METHODOLOGY

The verification of the implementation effect of a sustainability protocol on workers working remotely took place through a survey, as follows:

Firstly, sending a questionnaire to gather information, in the next stage sending the protocol and, finally, sending the questionnaire again for data analysis, thus completing the research.

Through the use of qualitative multiple correspondence analysis research, it will be possible to analyze the group of people surveyed, being able to identify changes in behavior based on the data received (SOUZA, 2010).

In the next topics of this article, research details, target audience, questionnaire and protocol will be presented.

3.1 Research

The research took place over five weeks, with a group of people who work exclusively remotely. The self-administration questionnaire technique was used to collect data, as this form of questionnaire application suits the objective proposed for this work. In the self-administration technique, the questionnaire is sent over the internet, so that respondents can fill it out themselves (VIEIRA, 2009).

Those surveyed ones received the questionnaire and protocol by email, through “mailing”, chosen mean of communication because it is an official corporate channel for companies. The questions in the questionnaires were made available via Google Forms, from Google, a platform chosen because it has free, easy and simple access for those surveyed, through an internet link.

3.2 The Target Audience of the Research

The target audience of this research was exclusively workers who work full-time remotely, therefore people who work in other types of work were not part of the research.

To choose the surveyed ones, the convenience sampling technique was used (VIEIRA, 2009). Convenience sampling is a non-probability sampling technique in which the surveyed are people to whom the researcher has some form of access or contact, not representing the entire population, but having been selected because they are the target audience for the research.

To find the research target audience, the researcher's contact/knowledge network via the social network “LinkedIn” was used. This was the found option found, as it is a social network with a professional focus, with the possibility of contacting people and exchanging professional information through the platform.

At the time of the research, 76 professionals were part of my contact network on “LinkedIn”. Through this data, the sampling calculation was used in a simple and random way, using a sampling error of 5%, with a confidence interval of 95%, the objective was to reach the amount of 54 people who fit the profile of the target audience established in the search.

Having identified the public to be approached, and with the need to find the largest number of workers, who worked remotely and who agreed to participate in the research, a Google Forms form was created, with the aim of inviting people in a quick and accessible form.

People in the contact network were contacted in different ways, some personally, but the majority through telephone contact or by message via the social network “WhatsApp”, a tool through which the invitation form was also made available. This action was very important for the process because, in the contact made, all people approached, whether they were from the target audience (remote workers) or not, were authorized to share the invitation form to acquaintances and, with this movement, it was possible to increase the range of people to participate in the research. Below, in table 1, is the form used to participate in the research.

Table 1: Google Forms Form – Invitation to Participate in the Research.

<p>Hello, my name is Anderson Tadeu Barbosa, I am a researcher in the Professional Master's Program in Environmental Management Sustainability at the Federal University of São Carlos – UFSCar and I invite you to take part in my research, which focuses on sustainability in remote work.</p> <p>I am inviting people who work in the "full-time remote work" modality to take part in this research that will be carried out over a 5 weeks period, as follows:</p> <p>1st Week: Sending a questionnaire (via Google Forms - estimated completion time of 5 minutes);</p> <p>2nd Week: Sending the booklet on sustainability in remote work, part 1 (expected to read in 5 minutes);</p> <p>3rd Week: Sending the booklet on sustainability in remote work, part 2 (expected to read in 5 minutes);</p> <p>4th Week: Sending the booklet on sustainability in remote work, part 3 (expected to read in 5 minutes);</p> <p>5th Week: Sending a questionnaire (via Google Forms - estimated completion time of 5 minutes).</p> <p>The research is expected to start in April, and the questionnaire and booklet will be sent by email.</p>

Please note that your email will be used solely and exclusively to contact the research organizer and that all information obtained will be confidential, ensuring confidentiality of information.

More information about the survey will be sent in the initial email.

Thank you very much for your collaboration. Your participation is essential for this research!!!

A big hug.

If you are interested in participating in the survey, please enter your email in the field below and click send.

A:-----

Source: Author, 2023.

A total of 96 people agreed to participate in the research and provided their contact email. These people originated a mailing list, which was used as a mean of contact and sending the survey.

This research did not focus on any specific institution, only on workers who work remotely, without distinction of their activity field. The criteria for excluding research participants was the non-consent to the ICF, informed consent form, and failure to fill in a personal email as a participant validation.

3.3 The Questionnaire

The use of a questionnaire as a technique to obtain data aimed to collect the opinions, knowledge, expectations, interests, etc., experienced by those surveyed (GIL, 2018).

The questionnaire was prepared in a multiple-choice format, providing respondents with a certain number of alternative answers to each question (CARMO, 2013).

The questionnaire, initially composed by questions with the objective of identifying respondents, is shown in Table 2:

Table 2: Questions for Identification of Respondents

<p>Name:</p> <p>Gender: () 1- Female () 2- Male () 3- I prefer not to say () 4- Other</p> <p>Age range: () 1 - from 18 to 30 years old () 2 - from 31 to 40 years old () 3 - from 41 to 50 years old () 4 - from 51 to 60 years old () 5 - over 61 years old.</p> <p>How many people live in the house: () 1- 01 person () 2- up to 03 people () 3- up to 05 people () 4- more than 5 people</p> <p>Do you have an exclusive environment to perform remote work: () 1- Yes () 2- No</p> <p>Is the environment used for remote work shared?: () 1- Yes () 2- No</p> <p>Do you receive any protocol or guidance material from your company periodically (weekly, fortnightly or monthly) on sustainability in remote work?: () 1- Yes () 2- No</p>
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Source: Author, 2023.

After the questions from table 2 above, there are 15 questions that are linked to remote work sustainability. They were created based on the remote work sustainability booklet that was used in the protocol. The 15 questions are in table 4 below.

Aiming to reduce subjectivity in the responses and obtain an easy understanding of the person surveyed, the scale model was used to analyze attitudes, perspectives and preferences, the Likert scale (FEIJÓ. et al., 2020). As the study aims to verify the change in people's behavior, to facilitate understanding and comprehension, staggered alternatives were constructed, with frequency expressions (VIEIRA, 2009). They follow in table 3.

Table 3 – Scaled frequency expression alternatives.

() Never () Rarely () Sometimes () Often () Always

Source: Author, 2023.

Below, in table 4, there are the 15 questions, which will be used in the questionnaire to guide and conclude the research, to observe the change in behavior of those surveyed.

Table 4 – Questionnaire questions linked to frequency expression alternatives, to observe changes in behavior.

<p>1º If you need to use water (for food, hygiene, etc.), do you turn off the tap in between uses when the water is not needed, avoiding waste?</p> <p>2º Do you try to reduce your electricity consumption?</p> <p>3º When purchasing an electronic device, do you look for equipment that has an energy efficiency certificate?</p> <p>4º When taking a break during working hours (lunch, snack, etc.) do you turn off or put your computer/notebook in standby mode?</p> <p>5º After the work day, do you turn off your computer/notebook?</p> <p>6º Do you unplug equipment that is not being used (example: cell phone chargers, microwaves, television, etc.)?</p> <p>7º In your daily activities, if natural light is available, do you prioritize using it instead of electric light (bulbs)?</p> <p>8º Do you usually turn off the lights in the rooms when you are away from them (example: lights in the office, bedroom, bathroom, living room, etc.)?</p> <p>9º When purchasing light bulbs, do you prioritize purchasing LED bulbs over other models, because they consume less electricity (for example, other models: incandescent, fluorescent, etc.)?</p> <p>10º Do you avoid using single-use plastic products, such as disposable cups/straws/plastic bags?</p> <p>11º Have you ever reused (transformed or given a new use to) a material you have that was unused, instead of discarding it?</p> <p>12º Do you prioritize the use of digital files over prints?</p> <p>13º When documents need to be printed, do you prioritize double-sided printing?</p> <p>14º Do you separate waste so that each material is disposed of appropriately?</p> <p>15º Do you use or have you used places for disposal waste?</p>

Source: Author, 2023.

To validate the questionnaire, the questions were sent to the Human Research Ethics Committee, and its application was subject to its approval, which, once received, allowed the implementation of the research, with the questionnaire aligned with the objectives of this study.

3.4 The Protocol

The protocol used in this research is the periodic implementation of a sustainability booklet, this booklet was prepared by the Univasf Sustentável program at the Federal University of Vale do São Francisco. The booklet addresses sustainability and productivity in remote work, with tips that can make your home (remote work environment) a more sustainable environment (BOMFIM. et al., 2021).

A concern for implementing the research was finding the ideal duration of the entire process, as some risks were present in this research, such as:

- A very short period might not be enough for people to implement some of the sustainability practices at work in their routines. This factor would be very harmful to the research, because it would greatly reduce the possibilities of changing people's behavior;
- A too long a period could cause participants to drop out throughout the process. This factor would have an impact on the research, as it would completely affect the results.

Therefore, to establish the duration of the protocol application, the model verified in the study carried out by MOURA (2017) was used, in which a practice of sending guidance materials on Green IT and Sustainability to those surveyed in a company. After analyzing the data obtained, it was observed that the participants in the research indicated that the weekly frequency of sending guidance material is the most appropriate for achieving the objectives of raising awareness among the target audience.

In view of the study presented above, the weekly frequency was used in this research to send the protocol to the selected group of people who work remotely.

Aiming to adapt the sustainability booklet to the protocol submission period, the material was divided into three parts, each containing the same number of pages and, in its entirety, covering all the content available in the original.

3.5 Research's Conclusion

After completing the research, data analysis began, with the tabulation of all responses obtained in the two questionnaires, context and conclusion, and the data placed in two spreadsheets, one for each questionnaire.

With the tabulated spreadsheets, validation of the research participants was carried out, this occurred, checking the people who started and completed their participation in the research. It was found that 33 respondents completed their participation in the research and, based on the data obtained from these people, the basis for analyzing the results was created.

3.6 Data Analysis

The data obtained through the research made it possible to visualize the change in behavior of those surveyed. Analyzing the data carried out using the multiple correspondence

analysis technique, which is a multivariate and exploratory technique, that has the ability to analyze a grouping of data with categorical variables (DO NASCIMENTO, 2013).

Data analysis using the multiple correspondence analysis technique was carried out with the help of a specific software called “Jamovi”. By carrying out statistical analysis, it was possible to demonstrate through graphs the effect of applying the protocol.

The “Jamovi” software, which was used to analyze the collected data, was chosen because it has the function of multiple correspondence analysis, which directly meets the analysis objective of this study and also because it is easily accessible and free software.

Data entry into “Jamovi” took place as follows:

1 - Transport of all data obtained in responses to the baseline questionnaire, of the 33 surveyed, including the questionnaire questions, the variables and the answers to the categories;

2 – Transport of all data obtained in the responses to the conclusion questionnaire, of the 33 surveyed, including the questionnaire questions, the variables and the answers to the categories.

4. RESULTS ANALYSIS

The analyzed data were obtained through the answers to the questionnaires completed by the 33 people who started and completed the research. This data was tabulated and inserted into two different spreadsheets, the first with the guidance data and the second with the answers to the questionnaire that concluded the research.

For better visualization and analysis of data and results, the two moments of collecting questionnaire responses were given the following names:

- Pre-protocol (for responses obtained before implementing the protocol);
- Post-protocol (for responses obtained after its implementation).

These denominations were used to facilitate the presentation of results in the graphs, as well as to associate the different moments of data collection.

To check whether there was any change in behavior in people who fully participated in the research, the data was entered into the Jamovi statistical analysis software, using the multiple correspondence analysis option (function available with the installation of the “plug-in” called “MEDA”).

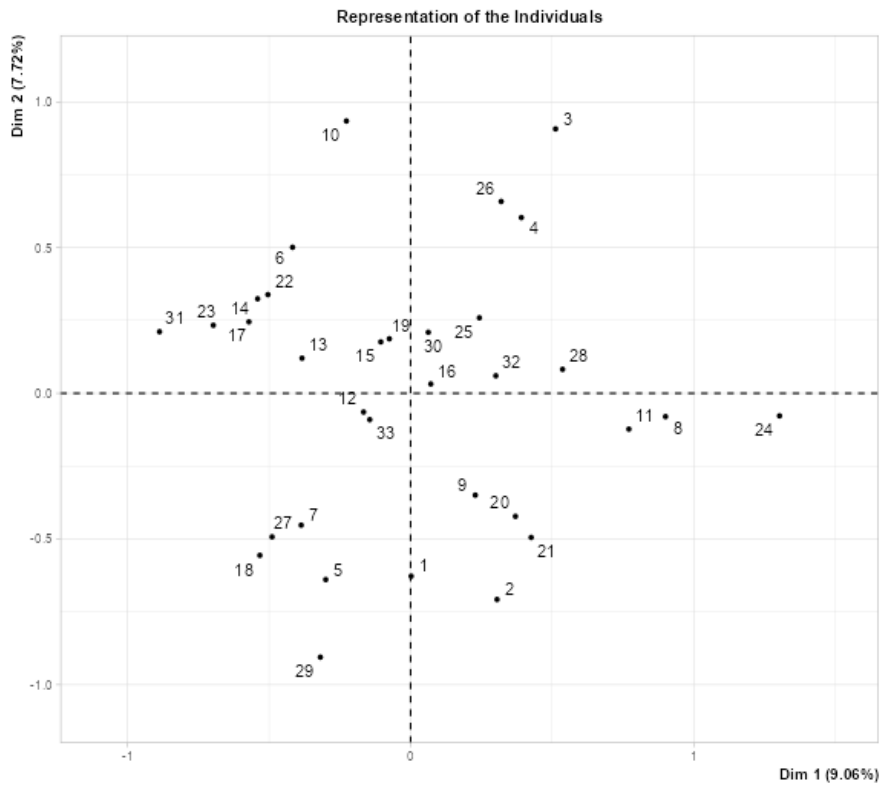
When inserted, the “variables” were the questions in the questionnaire and the “categories” were the answers obtained. Therefore, this process was carried out twice, first with pre-protocol data and then with post-protocol data to visualize the results.

The carried out analysis was to visualize the “representation of individuals”, this graph presents points identified by numbers that represent each of the 33 research participants. The points location on the graph was of fundamental importance for analyzing the change in people's behavior, by comparing the graphs from the pre-protocol with the post-protocol, it was possible to observe the change in behavior through the change in the point location within the graphic.

Below in figures 1 and 2, we have the result of the multiple correspondence analysis with all the data obtained from the 33 research participants. In this way, presenting two graphs,

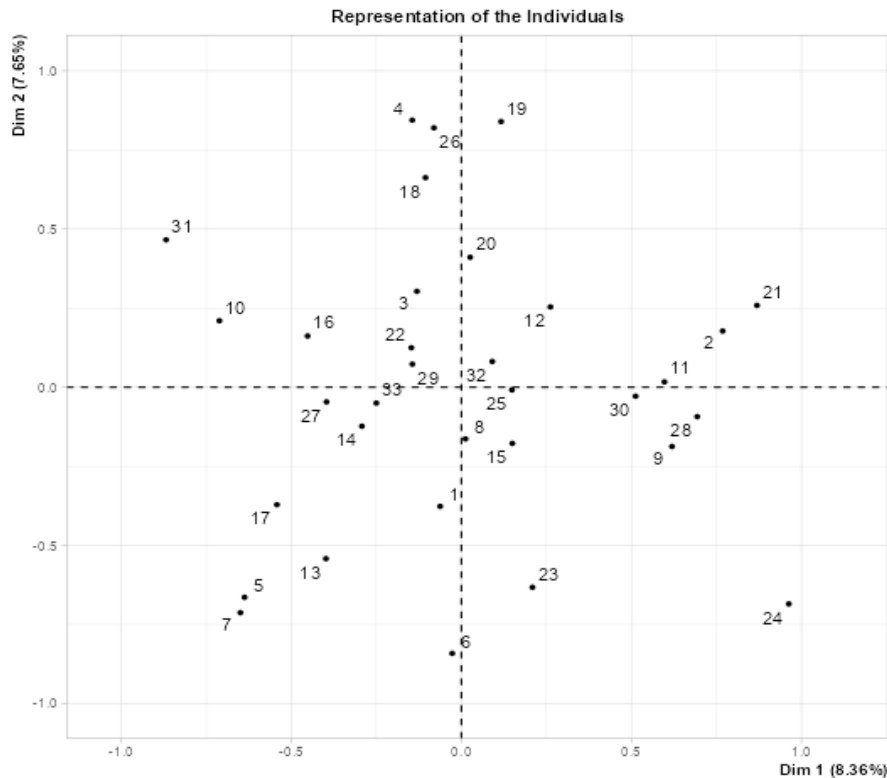
the first will contain the responses of those surveyed, in the pre-protocol and the second with the results of the post-protocol:

Figure 1: Representation of pre-protocol individuals.



Source: Author, 2023.

Figure 2: Representation of post-protocol individuals.



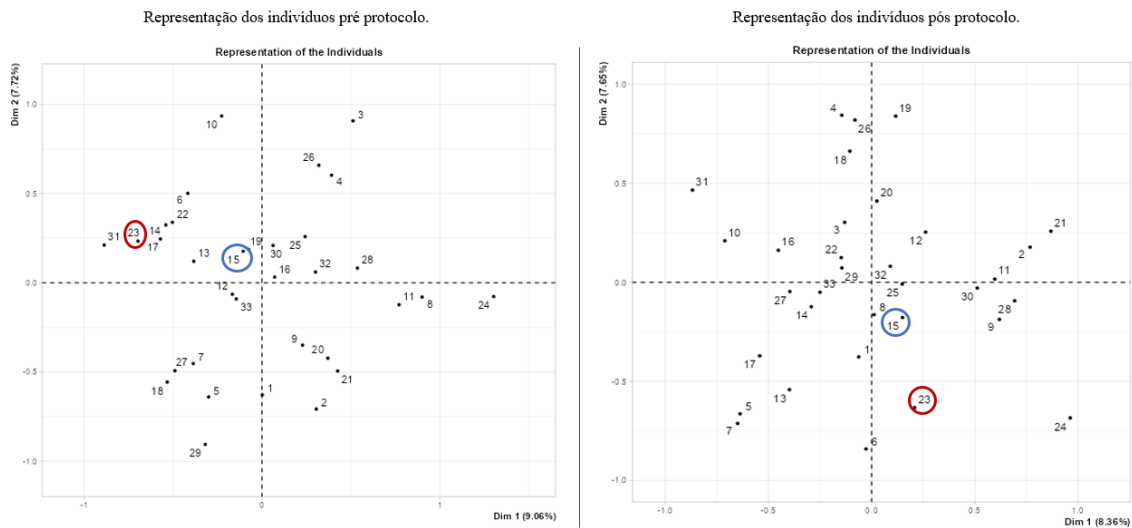
Fonte: Autor, 2023.

In figures 1 and 2, above, we can see the points that are followed by a number that represents each of the 33 research participants. I emphasize that this number was fixed for each person surveyed, so that it was possible to observe the change in people's behavior, by changing the point location when comparing the graphs that were called pre-protocol and post-protocol.

Analyzing the four quadrants of each graph and comparing them, it is observed that all 33 respondents had some change in behavior from the pre-protocol to the post-protocol, demonstrating that the application of the protocol caused a change in behavior in the survey respondents.

Another relevant factor was viewing significant changes in the behavior of those respondents, as in the case of people who in the pre-protocol graph were located in one quadrant and in the post-protocol, moved to another quadrant opposite to the initial one. As an example, we have those surveyed with numbers 23 and 15, as shown in figure 3, below.

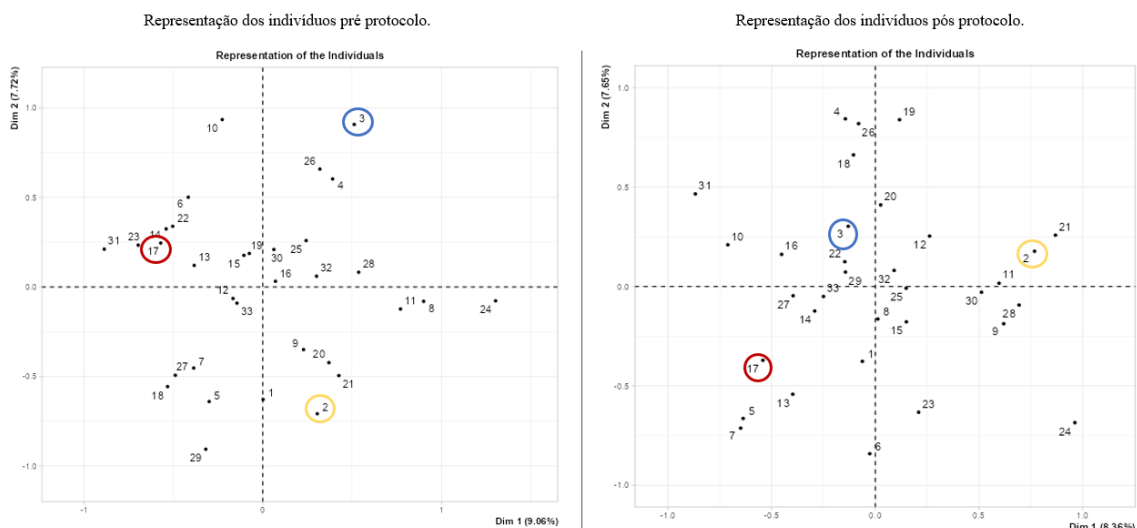
Figure 3: Individuals representation - comparison of respondents numbered 23 and 15, in the pre and post protocol.



Source: Author, 2023.

There were also many quadrant changes that were very representative, as in the examples of the numbers 17, which left the upper left quadrant and went to the lower left, the number 3, leaving the upper right quadrant and made the transition to the upper left and the number 2 which was located in the lower right quadrant and went to the upper right quadrant, see figure 4, below:

Figure 4: Individuals Representation - comparison of respondents numbered 23 and 15, in the pre and post protocol.

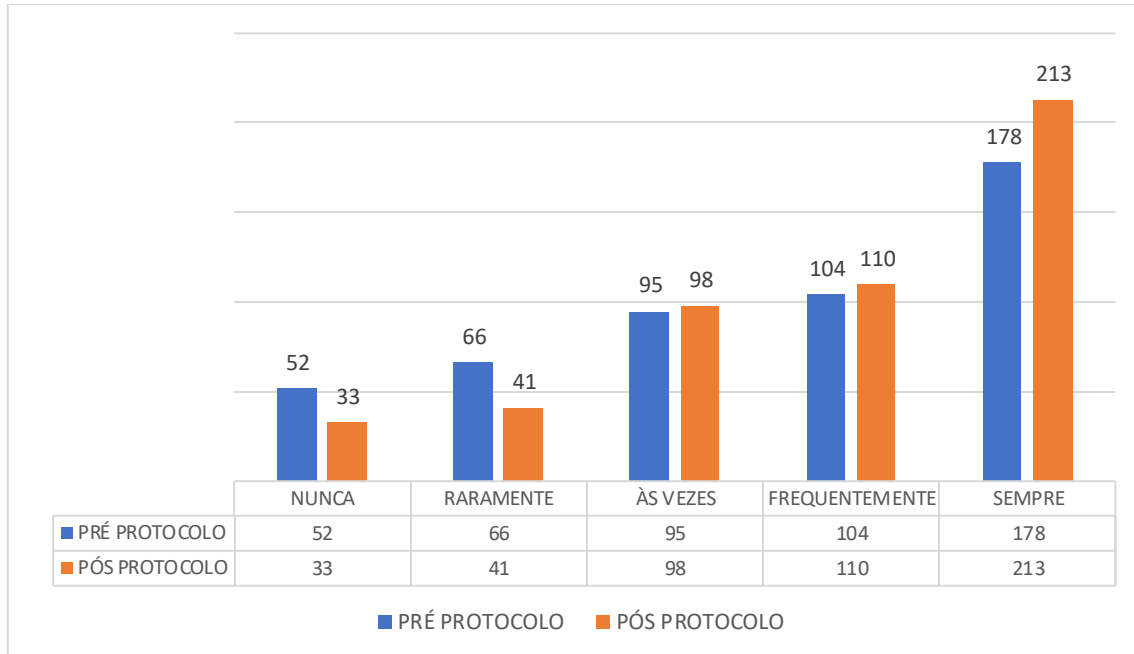


Source: Author, 2023.

In a more simplified way, below in figure 5, we have a comparison of the data from the questionnaire responses. They were compiled by number of responses in relation to each

of the questionnaire questions linked to the Frequency expression (“never”, “rarely”, “sometimes”, “frequently” and “always”), in the pre and post protocol.

Figure 5: Comparison of responses to questionnaires before and after applying the protocol.



Source: Author, 2023.

In the graph above, there is a marked reduction in the indications of “never” and “rarely”, which occurred in the pre-protocol compared to the post-protocol. And the consequence was a considerable increase in “always” indications post-protocol.

This representation is another example of the change in people's behavior when applying the sustainability protocol to remote work.

5. CONCLUSION

Considering the objective of this study, we were able to verify that the implementation of a sustainability protocol in remote work had an impact on people and caused them to change their behavior, to the point of increasing the frequency that they apply sustainable practices in their work environment.

The result observed in this study was positive, as all people surveyed had at least one behavior change and, in most cases, implementing or increasing the frequency of carrying out sustainability practices when working remotely, after applying the protocol.

In this way, this study shows that changing people's behavior is possible and the implementation of sustainability practices in remote work is viable.

Therefore, companies, institutions, organizations, etc., can implement actions such as the model used in this study or similar ones, which will have great possibilities of achieving the result obtained in this sample. The application of the protocol was an awareness-raising action

that was confirmed to be positive and effective among the surveyed public, and could be a starting point for these people to increasingly apply sustainable practices not only in their day-to-day work, but also in their aims as a whole.

The multiplication of sustainable actions is the path we must follow in search of a better and more sustainable society for everyone.

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