Higher Nationals

Internal verification of assessment decisions – BTEC (RQF)

INTERNAL VERIFICATION – ASSESSMENT DECISIONS					
Programme title	BTEC HND in Computing				
Assessor	Ms.Gayani Nisansala		**Internal Verifier**	Mr .Lakindu Premachandra	
Unit(s)	Unit 13: Computing Research Project				
Assignment title	Final Research Project Proposal - The environmental impact of digital transformation				
Student's name	Ranudi Gayathmie Kariyapperuma				
List which assessment criteria the Assessor has awarded.	**Pass**		**Merit**		**Distinction**
INTERNAL VERIFIER CHECKLIST					
Do the assessment criteria awarded match those shown in the assignment brief?	Y/N				
Is the Pass/Merit/Distinction grade awarded justified by the assessor's comments on the student work?	Y/N				
Has the work been assessed accurately?	Y/N				
Is the feedback to the student: Give details: • Constructive? • Linked to relevant assessment criteria? • Identifying opportunities for improved performance? • Agreeing actions?	Y/N Y/N Y/N Y/N				
Does the assessment decision need amending?	Y/N				
Assessor signature			**Date**		
Internal Verifier signature			**Date**		
Programme Leader signature (if required)			**Date**		
Confirm action completed					
Remedial action taken Give details:					
Assessor signature			**Date**		

Internal Verifier signature		**Date**	

Programme Leader signature (if required)		**Date**	

Higher Nationals - Summative Assignment Feedback Form

Student Name/ID	Ranudi Gayathmie Kariyapperuma - KIR/X-00104243		
Unit Title	**Unit 13: Computing Research Project**		
Assignment Number	**1**	**Assessor**	
Submission Date	31.08.2023	**Date Received 1st submission**	
Re-submission Date		**Date Received 2nd submission**	

Assessor Feedback:

LO1 Examine appropriate research methodologies and approaches as part of the research process

Pass, Merit & Distinction Descripts **P1** ☐ **P2** ☐ **M1** ☐ ☐ **D1**

Grade:	**Assessor Signature:**	**Date:**
Resubmission Feedback:		
Grade:	**Assessor Signature:**	**Date:**
Internal Verifier's Comments:		
Signature & Date:		

* Please note that grade decisions are provisional. They are only confirmed once internal and external moderation has taken place and grades decisions have been agreed at the assessment board.

Assignment Feedback

Formative Feedback: Assessor to Student			
Action Plan			
Summative feedback			
Feedback: Student to Assessor			
Assessor signature		**Date**	
Student signature		**Date**	

Pearson
Higher Nationals in
Computing

Unit 13: Computing Research Project
Project Proposal

General Guidelines

1. A Cover page or title page – You should always attach a title page to your assignment. Use previous page as your cover sheet and make sure all the details are accurately filled.
2. Attach this brief as the first section of your assignment.
3. All the assignments should be prepared using a word processing software.
4. All the assignments should be printed on A4 sized papers. Use single side printing.
5. Allow 1" for top, bottom , right margins and 1.25" for the left margin of each page.

Word Processing Rules

1. The font size should be **12** point, and should be in the style of **Time New Roman**.
2. **Use 1.5 line spacing**. Left justify all paragraphs.
3. Ensure that all the headings are consistent in terms of the font size and font style.
4. Use **footer function in the word processor to insert Your Name, Subject, Assignment No, and Page Number on each pag**e. This is useful if individual sheets become detached for any reason.
5. Use word processing application spell check and grammar check function to help editing your assignment.

Important Points:

1. It is strictly prohibited to use textboxes to add texts in the assignments, except for the compulsory information. eg: Figures, tables of comparison etc. Adding text boxes in the body except for the before mentioned compulsory information will result in rejection of your work.
2. Avoid using page borders in your assignment body.
3. Carefully check the hand in date and the instructions given in the assignment. Late submissions will not be accepted.
4. Ensure that you give yourself enough time to complete the assignment by the due date.
5. Excuses of any nature will not be accepted for failure to hand in the work on time.
6. You must take responsibility for managing your own time effectively.
7. If you are unable to hand in your assignment on time and have valid reasons such as illness, you may apply (in writing) for an extension.
8. Failure to achieve at least PASS criteria will result in a REFERRAL grade .
9. Non-submission of work without valid reasons will lead to an automatic RE FERRAL. You will then be asked to complete an alternative assignment.
10. If you use other people's work or ideas in your assignment, reference them properly using HARVARD referencing system to avoid plagiarism. You have to provide both in-text citation and a reference list.
11. If you are proven to be guilty of plagiarism or any academic misconduct, your grade could be reduced to A REFERRAL or at worst you could be expelled from the course

Student Declaration

I hereby, declare that I know what plagiarism entails, namely to use another's work and to present it as my own without attributing the sources in the correct form. I further understand what it means to copy another's work.

1. I know that plagiarism is a punishable offence because it constitutes theft.
2. I understand the plagiarism and copying policy of Edexcel UK.
3. I know what the consequences will be if I plagiarise or copy another's work in any of the assignments for this program.
4. I declare therefore that all work presented by me for every aspect of my program, will be my own, and where I have made use of another's work, I will attribute the source in the correct way.
5. I acknowledge that the attachment of this document signed or not, constitutes a binding agreement between myself and Pearson , UK.
6. I understand that my assignment will not be considered as submitted if this document is not attached to the assignment.

ranudigk@gmail.com

Student's Signature: **Date:** 31.08.2023

(*Provide E-mail ID*) **(*Provide Submission Date*)**

Higher National Diploma in Computing

Assignment Brief

Student Name /ID Number	Ranudi Gayathmie Kariyapperuma - KIR/X-00104243
Unit Number and Title	Unit 13 – Computing Research Project
Academic Year	2021/22
Unit Tutor	Ms.Gayani Nisansala
Assignment Title	
Issue Date	27.06.2023
Submission Date	31.08.2023
IV Name & Date	

Submission format

Research Project Proposal

- The submission is in the form of an individual written report.
- This should be written in a concise, formal business style using single spacing and font size 12.
- You are required to make use of headings, paragraphs and subsections as appropriate, and all work must be supported with research
- Reference using the Harvard referencing system.
- Please provide a referencing list using the Harvard referencing system.

The recommended word limit is minimum 2000 words.

Unit Learning Outcomes:

LO1. Examine appropriate research methodologies and approaches as part of the research process.
Assignment Brief and Guidance:

. The environmental impact of digital transformation

The amount of data created and stored globally is expected to reach 175 Zettabytes by 2025, a six-fold increase from 2018. This will demand additional hardware and power consumption, which; in turn, will increase the environmental impact of the digital sector and there is already increasing attention on the environmental footprint of ICT equipment and services as they become more widespread in all aspects of human life. It is the responsibility of everyone to take action in addressing the challenges of climate change, as professionals we must also seek ways that the digital sector can play its part. While digital technologies are one of the sectors that has achieved greater efficiency; achieving about 100 times more computation power from the same amount of energy per decade, it remains unsustainable. The sector must continue to seek ways in which it can continue to support and drive innovation, while addressing the global climate emergency for a greener and fairer future.

Choosing a research objective/question

Students are to choose their own research topic for this unit. Strong research projects are those with clear, well focused and defined objectives. A central skill in selecting a research objective is the ability to select a suitable and focused research objective. One of the best ways to do this is to put it in the form of a question. Students should be encouraged by tutors to discuss a variety of topics related to the theme to generate ideas for a good research objective. The range of topics discussed could cover the following:

- The use of modern methods to reduce carbon emissions in IT network systems.
- The impact of cloud data centres on the environment.
- The environmental implications of e-waste and ways to reduce it.

The Learner requires to produce a research proposal that clearly defines a research question or hypothesis, supported by a literature review (Use the project proposal and ethical consideration form template formats)

Project Proposal should cover following areas.

1. Definition of research problem or question. (This can be stated as a research question, objectives or hypothesis)
2. Provide a literature review giving the background and conceptualisation of the proposed area of study. (This would provide existing knowledge and benchmarks by which the data can be judged)
3. Critically evaluate research process /different research methodologies that can be applied to computing research project by demonstrating an understanding of the pitfalls, ethical issues, and limitations. choose a suitable research methodology and justify the selection based on theoretical/philosophical frameworks.

Draw points (1–3, above) together into a research proposal by getting agreement with your tutor.

Research Proposal Form

Student Name	Ranudi Gayathmie Kariyapperuma		
Student number	KIR/X-00104243	**Date**	31.08.2023
Centre Name	Kiribathgoda		
Unit	Unit 13 – Computing Research Project		
Tutor	Ms.Gayani Nisansala		
Proposed title			
The environmental impact of digital transformation in zoom platform			

Section One: Title, objective, responsibilities
Title or working title of research project (in the form of a question, objective or hypothesis): Research project objectives (e.g. what is the question you want to answer? What do you want to learn how to do? What do you want to find out?): Introduction, Objective, Sub Objective(s), Research Questions and/or Hypothesis

Introduction

The rise of digital connection, epitomized by Zoom and other platforms, has completely changed the way we communicate and carry out our daily business in both personal and professional contexts. In an increasingly digitalized world, Zoom in particular has become a virtual communication mainstay, enabling continuous connectivity. But a parallel story of environmental worries has emerged with the rise of digital technologies. The complex relationship between technology and its environmental impact has come to light as a result of the increasing data consumption, growing energy demands, and ensuing spike in e-waste creation.

A thorough analysis is required to examine Zoom's impact within Sri Lanka's socio-environmental fabric due to a number of important factors. Zoom is becoming a crucial tool for corporate operations, educational efforts, and social connectivity as the country witnesses a fast upsurge in digital integration across numerous sectors. It is imperative to investigate Zoom's environmental implications in light of this background and the growing emphasis on ecologically sustainable technology practices.

Fundamentally, the goal of this study is to carefully assess the environmental effects that Zoom's operations in Sri Lanka entail. Comprehending the environmental impact of digital platforms, such as Zoom, is essential for guiding the adoption of technology toward responsible and sustainable usage. Understanding how platforms like Zoom affect the environment is crucial to the growth of sustainable technology, particularly as the world faces growing concerns about climate change and environmental damage.

Using a mixed-methods approach that combines quantitative and qualitative techniques, this study aims to provide a comprehensive picture of Zoom's environmental impact. The multifaceted study aims to decipher the complex relationship between Zoom's features and their effects on the environment. This thorough investigation, which aims to uncover complex insights regarding the platform's environmental footprint, centers on factors including carbon emissions, energy usage trends, and the development of electronic waste.

This study is important because it has the potential to establish sustainable technological methods. Through an analysis and explanation of Zoom's present environmental effects, the study hopes to provide useful suggestions for reducing the platform's environmental impact. The envisioned symbiotic relationship between technological innovation and environmental preservation has the potential to influence policy decisions, propel technological progress, and foster responsible personal behavior.

With a focused focus on Sri Lanka's interaction with Zoom, this study aims to make a significant contribution to the worldwide conversation on environmentally conscious technology adoption, going beyond a regional exploration. Beyond a simple study, its goal is to spark important debates, spur legislative changes, and produce concrete initiatives that will help to ensure that technology and environmental sustainability coexist peacefully.

Research objectives

- **R01** : Analysis of User Awareness and Occupational Influence on Environmental Impact Perception
- **R02** : Examination of Usage Patterns and Environmental Awareness on Zoom
- **R03** : Evaluation of Energy Consumption Consideration and User Engagement
- **R04** : Analysis of Willingness to Embrace Environmentally Friendly Features on Zoom

Research Sub objectives

1: Evaluation by Comparison

- Comparative Awareness Analysis: Use Zoom to compare the environmental awareness of various professional groups.
- Study of Occupation Influence: Examine how various professional groups view and react to Zoom's environmental .
-

2: Investigation of Behavior and Perception

- Behavioral Analysis: Examine how people from different professional backgrounds use Zoom and how their conduct relates to environmental problems.
- Study on Perception and Attitude: Gain insight into how various professions view Zoom's environmental impact.

3: Methods of Engagement

- Engagement by Occupation: Use Zoom to find efficient ways to encourage various professional sectors to adopt eco-friendly practices.
- Customized Campaign Creation: Create targeted messages for different professional groups according to their Zoom-related environmental concerns.

4: Improvement of the Platform

- Customization and Adaptation: Identify ways to modify Zoom's platform to meet the various environmental requirements of various vocations.
- Feedback and Feature Integration: For ongoing development, include features according to expert demographic findings and get input from users.

Research Questions

Zoom has been a widely used tool in the context of Sri Lanka as a result of the global revolution in communication paradigms brought about by the emergence of digital platforms. Despite Zoom's technological superiority, its operations have resulted in environmental impacts that have prompted thoughtful consideration. With Sri Lanka seeing a rapid digital shift marked by an increased dependence on online platforms such as Zoom in many industries, worries about the environmental effects of this technology use are becoming more and more relevant.

The goal of this study is to understand the complex relationship that exists between Zoom's environmental impact in Sri Lanka and its operation. Fundamentally, the study is centered on a number of basic questions meant to fully comprehend the environmental consequences associated with Zoom's widespread use. These investigations explore the platform's impact on energy consumption trends, carbon emissions, and the production of electronic waste—each of these facets defining a crucial component of its environmental impact.

The examination is being guided by a set of multidimensional research questions in an effort to clarify these aspects. They attempt to interpret both the quantitative and qualitative aspects of Zoom's environmental effect, including its contribution to escalating or alleviating environmental issues in the context of Sri Lanka. By combining meticulous quantitative analysis with detailed qualitative evaluations, the research aims to disentangle the complex processes that underlie Zoom's impact on the environment.

Therefore, in light of the growing environmental consciousness and digital integration, this study aims to answer important problems that cross the boundaries between technology and ecological sustainability. By thoroughly investigating these research questions, this project hopes to provide information that guides tactics for encouraging a more ecologically responsible use of digital platforms such as Zoom in Sri Lanka's socio-environmental context.

As the study of this research author creates 20 research questions to create the form to the research. Above are the questions.

Q1) What's your profession?

Q2) What's your Age ?

Q3) What's your Gender ?

1.How frequently do you use Zoom for communication and collaboration purposes?

2.What types of devices do you primarily use for Zoom sessions?

3.Are you aware of the environmental impact associated with Zoom's operations?

4.Have you considered the energy consumption implications while using Zoom?

5.Would you be willing to adopt energy-saving practices while using Zoom?

6.How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?

7.Do you think Zoom could implement features to reduce its environmental impact?

8.Are you mindful of the potential e-waste generated by technology upgrades necessitated by Zoom?

9.Have you actively sought information about environmentally friendly alternatives to Zoom?

10.Are you inclined to switch to eco-friendly platforms if they were available and efficient?

11.Do you believe cloud-based data storage for platforms like Zoom contributes significantly to environmental issues?

12.How concerned are you about the overall environmental impact of the digital sector's rapid growth?

13.Would you participate in initiatives aiming to reduce e-waste generated by digital platforms like Zoom?

14.How important is it for tech companies to prioritize environmental sustainability in their operations?

15.Are you aware of the current strategies employed by Zoom to minimize its environmental footprint?

16.Would you support government regulations aimed at reducing the environmental impact of digital platforms?

17.Do you consider the environmental impact of Zoom when choosing communication tools?

18.Are you willing to sacrifice certain features or conveniences in Zoom for more environmentally friendly alternatives?

19.Should tech companies be transparent about their environmental impact for user awareness?

20.What measures, if any, have you personally taken to reduce the environmental impact of your digital usage, specifically related to Zoom?

Hypothesis

H1: By implementing energy-saving technologies and procedures into Zoom's digital infrastructure, the platform's exponential growth in data transmission and storage will result in a corresponding reduction in the environmental impact.

This hypothesis posits that Zoom's infrastructure will experience a measurable decrease in the environmental impact caused by increased data transmission and storage activities through the platform by incorporating energy-efficient technologies, such as server management techniques, optimized data compression algorithms, and sustainable data center operations.

H2: Zoom's failure to implement sustainable practices in response to the growing needs for data transmission and storage would have a more negative impact on the environment, leading to a considerable rise in its energy consumption and carbon emissions.

According to this hypothesis, Zoom will increase energy consumption and consequent carbon emissions if it does not adopt sustainable practices, such as energy-efficient data transmission protocols or renewable energy integration, to handle the growing demands for data transmission and storage made possible by its platform.

H3: Zoom's infrastructure will strategically incorporate renewable energy sources and improve hardware efficiency, which will lead to a significant decrease in the carbon emissions related to its data centers and operational procedures.

This hypothesis suggests that Zoom will significantly reduce the carbon emissions associated with its platform usage and infrastructure operations if it strategically integrates renewable energy sources (like solar and wind) and improves hardware efficiency (like more energy-efficient servers) within its data centers and overall operational structure.

H4: Zoom's inadequate focus on managing e-waste and poor use of its ICT equipment will worsen the environmental effects, exacerbating resource depletion and ecological deterioration.

This hypothesis highlights the possible consequences of Zoom failing to give ethical e-waste management and effective use of ICT equipment top priority. Ignoring these factors could result in worsening environmental damage, such as an increase in the amount of e-waste that collects and a lack of resources that Zoom needs to run its business.

Section Two: Reasons for choosing this research project

Reasons for choosing the project (e.g. links to other subjects you are studying, personal interest, future plans, knowledge/skills you want to improve, why the topic is important): Motivation, Research gap

Motivations

Environmental Concern: A strong sense of environmental responsibility is the main factor that led to the selection of this study topic. Understanding the environmental impact of digital technologies, especially those like Zoom, has become more important because to their rapid proliferation. This motivation stems from a desire to make a significant contribution to reducing the negative environmental effects brought on by technology breakthroughs.

Climate Consciousness: A keen understanding of the urgent problems caused by climate change is a strong incentive. A strong commitment to investigating how digital transitions, like those witnessed in Zoom, contribute to carbon emissions, energy consumption, and the development of e-waste, particularly within the localized context of Sri Lanka, is driven by the pressing need to solve these concerns.

Drive for constructive Impact: Through well-informed research, there is an innate drive to bring about constructive change. The goal of using study findings to promote sustainable

behaviors in digital ecosystems and lessen the environmental impact of technological progress is what motivates this work.

Technology and Sustainability Intersection: This is an important and fascinating area where technology and sustainability come together. The core of my academic and personal interests is investigating how digital transformations affect the environment. This fits in well with my love of technology and my developing concern for its effects on the environment.

Ethical Responsibilities: Given the moral obligation to examine the effects of technical progress, there is a compelling reason to expose the environmental effects of digital platforms such as Zoom. This is a result of a conviction that moral reflection and accountability are critical to determining how technology develops.

Promoting Knowledge-Based Decision-Making: The ultimate goal is to provide people, institutions, and decision-makers with thorough understandings obtained from this study. They will be better equipped to make decisions as a result, encouraging a more environmentally friendly and technologically sustainable cohabitation.

All of these reasons combine to make it necessary to set out on this study trip, which aims to clarify the intricate relationship between environmental sustainability and digital transformations, particularly as it relates to Sri Lanka.

Personal Interest

Passion for protecting the environment is my personal interest. The decision to pursue this study effort was primarily motivated by a strong personal interest in environmental preservation. Understanding how digital technologies affect the environment is fascinating, especially in Sri Lanka where there is a strong desire to promote eco-friendly behaviors and lessen ecological footprints.

Natural curiosity is the driving force behind the desire to learn more about the relationship between technology and environmental sustainability. I have a sincere curiosity about the

intricacies of how digital platforms, like as Zoom, impact the environment, and I enjoy venturing into unexplored territory when it comes to sustainability.

Motivated by Environmental Consciousness: Having an innate awareness of environmental issues makes one feel obligated to investigate the ecological effects of new technology developments. The goal is sincere in its desire to use sound research and practical ideas to make a constructive contribution to environmental conservation efforts.

Personal Alignment with Sustainable Living: A personal dedication to practicing and advocating for sustainable living is shown in the interest in this study project. Comprehending how digital developments affect the environment is in line with individual values and the goal of striking a balance between ecological preservation and technological advancement.

Want to Make a Significant Impact: People have a natural desire to contribute in a significant way to solving today's environmental issues. This project is in line with a strong desire to use research findings to promote sustainable practices in the technology industry and bring about positive change.

Alignment with Future Objectives: Examining how digital platforms like as Zoom affect the environment touches on future goals. In addition to doing research, the aim is to create the groundwork for prospective sustainability-related projects in the future that will support long-term professional objectives and individual ambitions.

Future Plans

Prospective Aims: Career Path: The selection of this research project is in line with future career pathways that are focused on environmental stewardship, technology, and sustainability. It is expected that the knowledge acquired from this project would provide a solid basis for future career endeavors centered around the nexus of technology and sustainability.

Advanced Academic Goals: This research project's completion is intended to serve as a springboard for more advanced academic pursuits. If you want to learn more about

environmental studies or sustainable technologies, this research project is a great place to start because it offers knowledge and experience from the real world.

Industry involvement: The knowledge gained from this study has the capacity to promote cooperation and involvement within the industry. The results of this study will be used in the future to advocate for ecologically friendly practices with technology corporations, environmental agencies, or sustainability-focused organizations.

The goal of policy advocacy is to use research findings to support policy frameworks that support sustainable technological innovation, with the ultimate goal of making a meaningful contribution to policy discussions. The goal is to impact and support regulatory agendas that give environmental stewardship a high priority in the development of new technologies.

Entrepreneurial Ventures: It is envisaged that the research findings would guide and inspire creative ideas for prospective entrepreneurial ventures centered around sustainable technology. The goal is to convert research findings into useful applications or business endeavors that reduce the negative environmental effects of digital technologies.

Educational Initiatives: There is a tendency toward educational initiatives as a result of anticipating chances to spread awareness and information. Future plans include for utilizing study findings to inform and empower people, groups, or communities about sustainable behaviors in the digital world.

Knowledge and Skills Enhancement:

Improvement of Knowledge and Skill Set: Research Approaches: The study project offers the chance to get more in-depth knowledge of research techniques, such as data gathering, analysis, and interpretation. Developing sophisticated research abilities, including methods for both quantitative and qualitative analysis, is the main goal.

The aim is to enhance one's understanding of environmental science, particularly with regard to energy consumption analysis, e-waste management, and carbon footprint assessment.

Gaining a thorough understanding of environmental impact assessment techniques in technological contexts is the goal.

Data Analytics: One of the main goals is to become more proficient with data analytics tools and processes. attempting to gain more proficiency with statistical analysis, managing huge datasets, and visual aids in order to extract valuable information from the gathered data.

Encouraging a deeper understanding across disciplines by incorporating information from sustainability, technological management, environmental studies, and policy-making. The aim is to integrate several viewpoints to achieve a comprehensive comprehension of the subject matter.

Critical Thinking and Problem-Solving: Developing critical thinking abilities to assess intricate environmental issues brought on by technological breakthroughs. acquiring strong problem-solving skills to provide creative and workable solutions.

Presentation and Communication: Developing communication abilities, especially in the area of clearly, succinctly, and captivatingly expressing complicated environmental themes. improving presenting abilities to share research findings with a range of stakeholders in the industry and academia.

Project Management: Gaining experience in project management by supervising the research project from start to finish. placing a strong emphasis on cooperation, time management, and organization to guarantee the research project's effective completion.

Ethical Considerations: In-depth discussion of the moral issues surrounding environmental research, including data integrity, confidentiality, and following moral standards when using human participants in studies.

Importance of the Topic

Global Environmental issues: In light of these issues, it is critical to comprehend how digital transformations, and platforms like as Zoom in particular, affect the environment. Given the growing challenges posed by climate change, it is critical to analyze the ecological footprint of technology in order to mitigate environmental deterioration.

The Pervasiveness of Technology: In today's Globalized Society, digital platforms are pervasive and have a significant impact on many facets of daily life. Given the widespread use of these technologies, it is imperative to acknowledge their prevalence and evaluate the effects they have on the environment.

Relevance in the Local Context: It is imperative to examine Zoom's environmental impact in the context of Sri Lanka. Research tailored to a particular region yields specialized insights that can guide focused approaches to deal with the nation's particular environmental problems.

Technological Innovation and Sustainability: Promoting sustainable technological innovation requires a strong focus on this topic. Comprehending and alleviating the ecological consequences of digital platforms is crucial for incorporating sustainability into technical breakthroughs, guaranteeing a harmonious coexistence of technology and the natural world.

Resource Conservation: Determining resource-intensive locations is made easier by evaluating the energy usage, carbon emissions, and e-waste production linked to digital platforms. This information is essential for maximizing the use of resources and reducing the pressure on the environment.

Implications for Policy and Decision-Making: This research's findings have a big impact on how policies and decisions are made. Providing empirical data on how digital transformations affect the environment enables legislators to create laws that support environmentally friendly technological practices.

Community Awareness and Action: By illuminating the environmental effects of digital technology, this research may increase community awareness and spur action, encouraging users to dispose of and utilize devices responsibly.

Long-term Environmental Sustainability: In the end, the study topic advances the more general goal of guaranteeing environmental sustainability over the long run. It is possible to lessen the ecological footprint of digital platforms such as Zoom and promote a more sustainable digital ecosystem by looking into and resolving their environmental effects.

Research Gap

Research Gap: Limited Localized Studies: In the field of digital platform environmental impact evaluations, there aren't many studies that particularly address Zoom's environmental impact in Sri Lanka. There is a knowledge gap on how this extensively used platform impacts the nation's ecological balance since there are no localized assessments available.

Absence of detailed evaluations: Although the environmental impact of digital technology is discussed in general, there are notably few detailed evaluations that account for carbon emissions, energy consumption, and the development of e-waste related to Zoom's operations in Sri Lanka.

Specificity to Zoom Platform: There is a noticeable research gap concerning an analysis that is platform-specific. Although more general research looks at how digital technologies affect the environment, Zoom's operations in Sri Lanka have not been thoroughly examined, which prevents tailored insights from being obtained.

E-waste Management Focus: Research that has already been done frequently ignores the unique e-waste generation and management techniques connected to Sri Lankan users of digital platforms such as Zoom. In this sense, there is an unexplored field of understanding user behaviors and disposal practices associated to Zoom-related electronic gadgets.

Lack of comparable Data: Understanding the localized effects of digital transformations in the nation is hampered by the absence of comparable data comparing Zoom's environmental impact in Sri Lanka to international benchmarks or industry norms.

Limited Policy-oriented Research: In Sri Lanka, there is a scarcity of research focusing on the policy consequences of environmental evaluations pertaining to digital platforms. The lack of emphasis on using empirical data to inform policy decisions leaves a vacuum in the conversion of research findings into workable policy frameworks.

Section Three: Literature sources searched
Use of key literature sources to support your objective, Sub Objective, research question and/or hypothesis: Can include the Conceptual Framework

Literature Sources Searched

The environmental impact of digital transformation in zoom platform

"the use of technology to radically improve the performance or reach of enterprises." was said by MIT Sloan Management ,Westerman et al about the meaning of Digital Transformation so that means how small process will transforming to digital. (Schallmo and Williams, 2018)

So if look the history of digital transformation the first revolution was the steam , the second one was the electricity, mass products , division of labor and the third one is the electronics and in that era was found the computer and internet also. So now is the fourth revolution unlike others in present use digital transformation all around the thing all industries such as biological, physical, computing like wise.(Jones, Hutcheson and Camba, 2021)

So in some studies say that there are three generation of the digital transformation .So in this first generation is 1980s that transforms to paperless procedures. In here invented A EDI based port community system. Basically it enables to exchange electronic documents between actors. In 1980 build the first commercial terminal operating system. So these are the main things that build in first generation When go to the second generation it was began between 1190s to 2000s it defines about the transformation to Automated procedures. So in this generation the inventors found laser technologies . Also in 2000 INTTRA was developed. As the study of these 3rd generation was 2010 to today and it shows about the Transformation to smart procedures. In this generation as mentioned in here talks about the beginnings of internet of things, big data, data analytics ,mobile computing and cloud computing. These are three generations of the digital transformation. (Heilig, Schwarze and Voß, n.d.)

So now Author will explain about the Environmental Implications of Digital Transformation. There is a complex relationship between digital transformation and environmental sustainability, and the field of science has discussed whether digital transformation encourages or prevents environmental sustainability.(Truong, 2022) Artificial intelligence (AI), big data analytics, mobile technologies, the Internet of Things (IoT), and social media platforms are examples of digital technologies that benefit both industry and society . Additionally, the improvement of environmental sustainability is utilizing digital technology more and more. Businesses are currently launching innovative digitally-based platforms and solutions to improve environmental sustainability.(Feroz, Zo and Chiravuri, 2021)

Inventors called goralski and Tan were invented a Smart water management system using AI technology. Also their in studies found that most of countries are using big data and IOT devices for build things for environmental sustainability issues and also to improve environment. Also some companies try to use AI,IOT and big data to reduce the carbon emissions and minimize the waste to the environment that is a good thing for the environment as well as the human. For enhancing food system it is better to use Big data analytics for it. Also blockchain is also a useful thing because it can minimize the resource usage and reduce carbon emissions. So this is about the environmental impact on digital transformation.(Feroz, Zo and Chiravuri, 2021)

If address about the local context like zoom adoption in srilanka. In srilanka the online teaching method , online platforms for meetings was not that popular until the Covid pandemic hits for to the country. When Covid pandemic hit the country all the country was lockdown and the business was go down all the industry works were stopped because of this but the IT industry companies doesn't go down because the all work they managed in online way. So all the schools ,companies were switching to do there stuff in online way. All students were teach in online Most probably teachers were used Zoom platform for it because it was easy to handle and easy access to people. Also it can educate with face to face education system. Also for the Medical things online platforms were very useful in that time period. (Joia and Lorenzo, 2021)

Also there were some problems such as During the Covid-19 epidemic, these include the lack of typical classroom socialization, reaction times, and direct teacher-student interaction because of the online teaching and learning process. Also some places around the country the students even didn't get to study in online because some places there aren't Data coverage or some students have phones or laptops in rurel places. (Wickremasinghe and Kumuduni, 2022)

Now the explanation about The envioremental impact in Zoom platforms. The ethical implications of greenhouse gas pollution and the responsibilities of governments and individuals to take action to prevent, reduce, and eradicate this pollution that causes extensive harm have been discussed by several theorists as a result of this commitment. One such requires you not to harm other people, at least not for your own benefit. Since emissions of

justification for taking environmental action is provided in a research paper that is “Justice requires you not to harm other people, at least not for your own benefit. Since emissions of greenhouse gas do harm, you should not make them”. This was said by John Broome in 2016. (Trappes et al., 2020)

Carbon Footprint of Digital Platforms

The introduction of smartphones with fast fixed broadband and mobile internet has drastically changed how people work, communicate, and consume information.

Notable developments in cellular networking, miniature sensors, new internet connection protocols, and the explosion of mobile software applications have made this possible. Since the first iPhone was released in 2007, mobile internet usage has increased dramatically.once represented the use of manually created spreadsheets and paper printouts, with individuals serving as the data's connecting points across the various software layers that make up a modern enterprise's operational software stack.So all of these things make sense about the enviormental and digital transformation.(Patsavellas and Salonitis, 2019)An important aspect of comprehending the environmental impact of digital platforms like Zoom is research on their energy usage patterns and resultant carbon emissions. Numerous studies have carefully examined these platforms' energy needs, covering a range of operational facets like as data centers, network infrastructure, and user devices. These investigations explore the complex mechanisms of data processing, storage, and transmission that occur during video conferences, offering insights into the energy-intensive operations that add to their carbon footprint.

In addition, scientists have created thorough ways to measure and calculate digital technology's carbon footprint. These methods include carbon accounting frameworks and life cycle evaluations, which help to quantify and assess the environmental effects of using these kinds of platforms. Studies that compare the carbon footprint of various video conferencing platforms have been developed, providing insight into the disparities in the effects on the environment. These studies provide important insights into the ecological effects of digital platforms by examining patterns of energy consumption and using advanced techniques for carbon footprint assessments. These insights can be used to inform strategies for environmentally conscious technology use and conservation efforts.

E-waste Generation and Disposal

Because technology is always evolving, a new waste stream known as EOL (End of Life) or Obsolete Electrical and Electronic Equipment has emerged. These devices were once widely discarded in both developed and developing countries. trash generated into this trash stream is commonly referred to as "e-waste" globally.The percentage of the cost of treating e-waste to the recovery of materials from it is rather high, and environmental regulations pertaining to recycling, recovery, and disposal are extremely strict in industrialized nations. Due to this high ratio, e-waste is transferred from industrialized to underdeveloped countries, increasing manifolds and promoting informal recycling in developing nations.(Vats, Singh and Vats, 2014)

The increased use of digital technology, especially websites like Zoom, has resulted in an alarming rise in the amount of electronic garbage (e-waste). Research on the management of electronic trash within the framework of digital communication networks explores the variety of abandoned gear, gadgets, and accessories. Determining the kind and amount of e-waste produced by these platforms is essential to developing efficient plans for recycling, disposal, and responsible end-of-life handling. The literature in this field underscores the negative effects that uncontrolled e-waste has on the environment and stresses the pressing need for recycling programs and sustainable disposal techniques to lessen those effects.

User Awareness and Behavioral Impact

Studies examining how users, especially Zoom users, perceive and act in relation to the environmental effects of technology offer important new perspectives on their awareness and attitudes. These studies explore how consumers understand and interpret the environmental consequences associated with digital platforms, including carbon emissions, energy use, and the production of e-waste. Designing educational campaigns and interventions targeted at promoting sustainable practices requires an understanding of how much this awareness effects user behavior during platform usage. The research's insights make it easier to create user-centered methods that encourage eco-conscious behavior and well-informed decision-making.

Corporate Sustainability and Responsibility

Research on the CSR programs of technology businesses—including those running platforms such as Zoom—reveals how committed these organizations are to environmental sustainability. The literature in this area examines the tactics, guidelines, and measures that tech companies have taken to reduce their environmental impact. Assessing these programs provides important information on how companies might support environmentally friendly activities, shape industry norms, and encourage the use of sustainable technologies. Comprehending the influence and efficacy of these business ventures is essential to promoting industry-wide sustainability initiatives and legislative advancements.

Energy Efficiency and Innovation

Research on energy-saving techniques and advances in digital platforms—particularly with regard to Zoom and related tools—contributes much to environmental initiatives. This field of study looks into new features, technology, or infrastructure improvements that can lower energy use and their impact on the environment. Through the examination of energy efficiency developments on these platforms, researchers significantly influence the direction of sustainable technology. Greener technical developments are encouraged by the insights gained from these research, which not only help eco-friendly methods evolve but also force a movement in the digital arena towards the wider adoption of sustainable ways.

Supporting Research Questions and Hypotheses

Carbon Footprint Comparative Analysis: Referencing studies comparing the carbon footprints of digital platforms in various geographical regions, providing context for understanding and comparing Zoom's impact in Sri Lanka with global benchmarks.

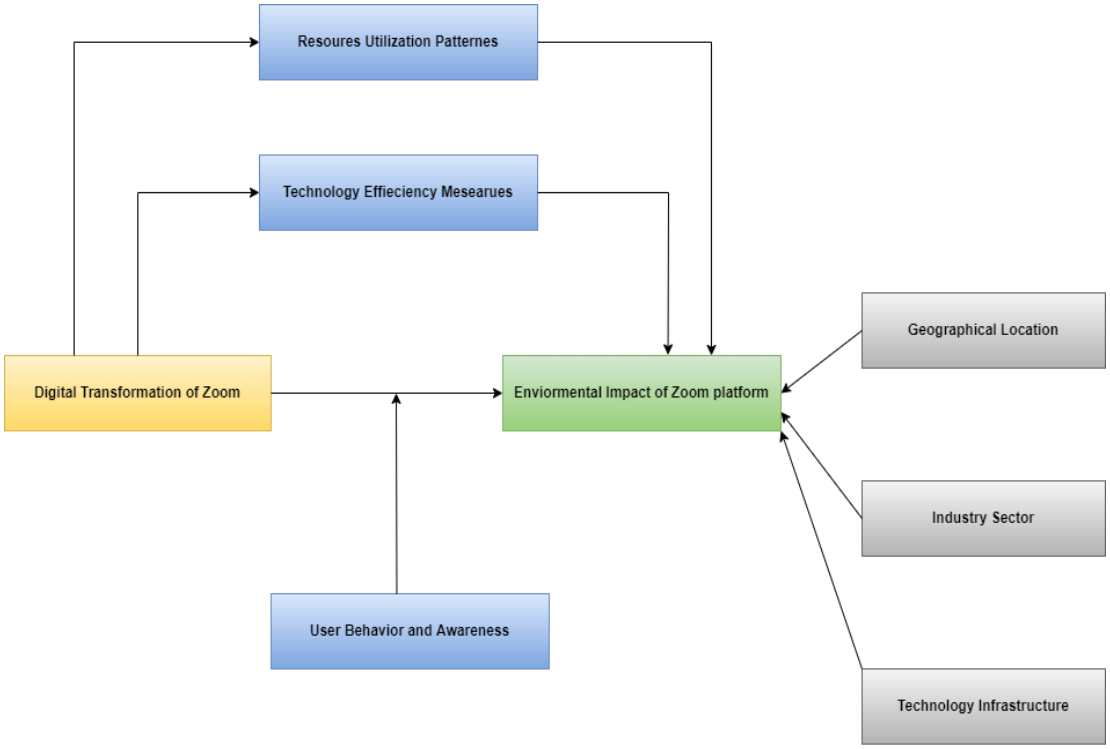
Energy Efficiency Enhancement Strategies: Drawing on research discussing technological advancements and innovations aimed at optimizing energy consumption within data centers and network infrastructures to support proposed strategies for enhancing energy efficiency within Zoom's operations.

Effectiveness of Environmental Strategies: Leveraging case studies and empirical research evaluating the effectiveness of implemented environmental mitigation strategies by

technology companies, supporting hypotheses about the impact of these strategies on Zoom's environmental footprint.

E-waste Reduction Recommendations: Utilizing research outlining successful e-waste reduction initiatives and behavioral interventions among technology users to inform recommendations for minimizing e-waste generation among Zoom users in Sri Lanka

Conceptual Framework



Independent Variable

The "Digital Transformation Level" is the independent variable in this instance. This variable measures the degree to which regions or companies have adopted and put into effect digital transformation strategies, especially when using the Zoom platform. It includes a thorough evaluation of how digital technologies—including Zoom—are incorporated and used into operational frameworks and procedures.

Dependent Variable

The "Environmental Impact" has been designated as the dependent variable. This variable denotes the overall environmental effects that result from the adoption and application of digital transformation procedures that make use of the Zoom platform. It includes a wide range of environmental effects, such as resource use, energy consumption, carbon emissions, and ecological footprints brought about by digital transformation activities..

Mediator Variables

Technological Efficiency Measures

"Technological Efficiency Measures" is the first Mediator Variable. These include intentional tactics, systems, or technology additions made as part of Zoom's digital transformation effort. The principal objective is to optimize resource allocation, lower carbon emissions, or improve energy efficiency in order to minimize the total environmental effect associated with digital transformation activities.

Resource Utilization Patterns:

"Resource Utilization Patterns" is an additional mediator variable. This variable focuses on assessing and comprehending the allocation, utilization, and management of diverse resources (such as energy, hardware, etc.) during the Zoom-enabled digital transformation process. It looks for and examines resource usage patterns or trends that could have a big influence on the way the digital transformation process affects the environment.

User Behavior and Awareness:

The third variable that was found as a mediator is "User Behavior and Awareness." This variable examines how users use the Zoom platform in the context of digital transformation in terms of their behaviors, attitudes, knowledge, and awareness of environmentally conscious practices. It looks at how user choices, actions, and awareness levels affect how digital transformation processes affect the environment.

Control Variables

Geographical Location

"Geographical Location" is one of the Control Variables. This variable attempts to address and control for differences in energy sources, infrastructure, and environmental legislation across various countries or geographical regions where Zoom is used in digital transformation techniques. It takes into consideration regional differences that could affect environmental results.

Industry Sector

"Industry Sector" is an additional control variable. Zoom-based digital transformation processes have an impact on the environment; variations in industry-specific practices, standards, and regulations are taken into account and controlled by this variable. It recognizes that depending on how they operate, different industry sectors may have different environmental footprints.

Technological Infrastructure Standards

"Technological Infrastructure Standards" has been selected as the third control variable. This variable takes into account rules, norms, or standards that affect environmental practices and technology infrastructure in relation to digital transformation operations that use the Zoom platform. It serves to adjust for differences in infrastructure that could have an impact on environmental results.

Section Four: Activities and timescales	
Activities to be carried out during the research project (e.g. research, development, analysis of ideas, writing, data collection, numerical analysis, tutor meetings, production of final outcome, evaluation, writing the report) and How long this will take:	
Milestone	**Propose completion data**
Choose a research topic.	29.06.2023
Choose samples to obtain data.	06.07.2023
Interview and administer a questionnaire to a sample of employees with a chosen employee	20.07.2023
Complete the research report	31.08.2023

Section Five: Research approach and methodologies
Type of research approach and methodologies you are likely to use, and reasons for your choice: What your areas of research will cover: Research Onion; Sample Strategy/Method; Sample Size

Research Approach

The plan or strategy that describes the research approach will direct the data collecting, analysis, and interpretation phases of the project. A mixed-methods study technique may prove beneficial in examining Zoom's environmental impact in Sri Lanka.With the use of both qualitative and quantitative methodologies, this mixed-methods approach provides a thorough understanding of the complex issues surrounding Zoom's environmental impact in Sri Lanka.

The measurement and analysis of numerical data related to Zoom's environmental impact would be made possible by quantitative approaches. This could entail quantitative evaluations of the generation of e-waste associated with Zoom's operations, statistical analyses of energy consumption trends, and carbon emissions. Zoom usage and its ecological effects can be better understood and patterns or connections can be found by quantifying these features.

Concurrently, qualitative approaches like focus groups, interviews, or ethnographic research could explore users' subjective experiences, beliefs, and actions concerning Zoom's influence on the environment. These qualitative methods provide important context and insight beyond

quantitative data by enabling a deeper investigation of users' attitudes, motivations, and difficulties with regard to eco-friendly habits when using Zoom.

By combining several approaches, one can take advantage of the advantages of each strategy while making up for the shortcomings of the others. Zoom's environmental impact in Sri Lanka can now be better understood thanks to this comprehensive approach, which takes into account both quantitative metrics and qualitative user insights. It also provides a thorough foundation for developing suggestions or countermeasures to lessen the environmental impact of the platform.

Methodologies

Using a quantitative approach, the study will conduct in-depth interviews with Zoom users in Sri Lanka in order to get quantitative information about their usage habits, patterns of energy consumption, and the amount of e-waste they produce as a result of Zoom's operations. throughout addition, calculations and existing models will be employed to approximate and measure energy usage and carbon emissions resulting from Zoom's operations throughout the nation. In addition to the quantitative component, qualitative methods such as focus groups and in-depth interviews with technology players, industry experts, and environmental advocates will be used. Through these qualitative interviews, important information on user behavior, effective methods, and mitigation techniques related to Zoom's environmental effect is intended to be gleaned. An examination of relevant case studies will yield insightful actual instances of environmentally conscious business strategies that technology businesses in Sri Lanka have successfully adopted.

Research Onion

Platforms like Zoom are at the forefront of global connectivity thanks to the rapidly evolving communication technologies that define the developing digital world. Concerns about these digital platforms' effects on the environment are growing as their use does. As data consumption and infrastructural demands are expected to rise, the environmental impact of these technologies comes under closer examination. Using an onion research methodology

to sift through the layers of Zoom's environmental impact, this study aims to examine and expose the ecological ramifications of the company's operations in Sri Lanka.

Understanding the Onion Research Methodology

In keeping with an objective ontology, the goal of this study is to conduct an objective analysis of Zoom's environmental effects in Sri Lanka. The aim is to evaluate the concrete environmental effects that result from Zoom's operations, which are based on factual and empirical data. From an epistemological point of view, the research combines quantitative and qualitative methods to create a detailed account of Zoom's environmental impact. Through the integration of quantitative data and qualitative perspectives, this methodology seeks to provide a comprehensive understanding of Zoom's environmental impact on Sri Lanka's digital landscape.

The study strategy uses a logical approach, exploring current hypotheses on how digital platforms affect the environment. The study intends to evaluate and validate the applicability of these ideas in the particular context of Zoom's operations in Sri Lanka through empirical data collection methods that include structured surveys, interviews, and case studies.

Through the application of the Onion Research Methodology, this study aims to clarify Zoom's current ecological footprint in Sri Lanka by dissecting the various layers of its environmental impact. Using a cross-sectional methodology, this analysis seeks to provide an overview of Zoom's environmental effects, including aspects of energy use, carbon emissions, e-waste production, and mitigation tactics. The study's methodology includes the use of structured questionnaires to collect qualitative insights through thematic analysis and interviews as well as quantitative data, allowing for a multifaceted investigation.

Onion Research Methodology

Philosophy

This study technique, which is based on facts and observable reality and adopts an objective ontology, aims to conduct an unbiased investigation into Zoom's environmental impact in Sri

Lanka. The objective of this assessment is to evaluate Zoom's operations' ecological effects in an unbiased and objective manner, facilitating an open and thorough investigation.

Epistemology

This strategy combines quantitative and qualitative methods in an epistemologically sound way to improve our comprehension of Zoom's environmental impact. It seeks to create a complete picture that encompasses Zoom's ecological footprint in Sri Lanka in both its width and depth by fusing hard data with in-depth qualitative perspectives.

Approach

The study strategy takes a deductive approach, starting with accepted ideas and body of information about the environmental effects of digital platforms. Through the use of empirical data gathering techniques including surveys, interviews, and case studies, it aims to confirm if these theories are applicable to Zoom's operations in the Sri Lankan environment.

Time Horizon

This study's cross-sectional investigation of Zoom's current environmental impact in Sri Lanka is focused on the study's temporal horizon. It attempts to depict the present situation of environmental effects linked to Zoom's operations, providing an overview of its ecological footprint.

Techniques

The project will gather and evaluate data using semi-structured interviews, formal surveys, and theme analysis. Quantitative data gathering is facilitated by structured surveys, whilst qualitative issues such as user behaviors, mitigation techniques, and environmental viewpoints related to Zoom's operations in Sri Lanka can be further explored through interviews and thematic analysis.

limitations and Adaptations

This methodology acknowledges that the research findings reflect a specific moment in time and may not capture longitudinal changes, in keeping with the constraints of a cross-sectional study. As a result, it is still flexible enough to allow for future adjustments and iterative

methodological improvements to take into account new information and shifts in Zoom's operational environment.

Digital Survey Data Collection

Online surveys provide a means of gathering large amounts of data in the digital age. This method makes use of web-based questionnaires specifically designed for Zoom users in Sri Lanka, which makes it easier to collect quantitative information about Zoom's impact and its usage patterns as well as environmental behaviors and perceptions. These surveys allow for widespread participation and reach a variety of user groups around the nation. They can be sent by email invitations, social media platforms, or specialized online forums. A wider range of responders can be accommodated while maintaining uniformity in data acquisition because to the digital format's ability to collect organized and standardized responses. The research can effectively gather the quantitative data required for evaluating Zoom's environmental impact by utilizing online survey technologies.

Virtual Interviews and Focus Groups Provide Qualitative Information

Virtual focus groups and interviews are useful tools for gathering qualitative information about Zoom's environmental impact in Sri Lanka. Through the use of video conferencing services, it is possible to arrange interviews with technological players, environmental campaigners, and industry experts while overcoming geographical limitations and promoting in-depth talks. Participants can share thoughts, strategies, and experiential knowledge about Zoom's environmental footprint through these sophisticated virtual engagements. Furthermore, virtual focus groups provide a cooperative setting where a range of viewpoints can come together, stimulating meaningful discussions and revealing qualitative information on user behavior, mitigation techniques, and environmental viewpoints in the digital space.The adaptability and accessibility of the digital medium aid in the thorough qualitative data collecting necessary to comprehend the nuances of Zoom's influence.

Utilizing Digital Tools for Analysis and Visualization

A wide range of software and tools are available in the digital realm for reliable data analysis and visualization, which is essential for processing and presenting research findings. Statistical software can be effectively utilized to handle quantitative data obtained from

online surveys. This allows for a thorough examination of usage trends, energy consumption patterns, and e-waste generation that can be traced back to Zoom's operations. Additionally, utilizing specialist software, qualitative insights from focus groups and virtual interviews can be subjected to thematic analysis, which can help discover reoccurring motifs and extract important narratives.

Reference List

Abuhamda, E.A.A. and Bsharat, T.R.K., 2021. Understanding quantitative and qualitative research methods: A theoretical perspective for young researchers. *Article in International Journal of Research*. [online] https://doi.org/10.2501/ijmr-201-5-070.

Feroz, A.K., Zo, H. and Chiravuri, A., 2021. Digital transformation and environmental sustainability: A review and research agenda. *Sustainability (Switzerland)*, 13(3), pp.1–20. https://doi.org/10.3390/su13031530.

Heilig, L., Schwarze, S. and Voß, S., n.d. *An Analysis of Digital Transformation in the History and Future of Modern Ports*. [online] Available at: <https://www.dakosy.de/en/solutions/>.

Johannesson, P. and Perjons, E., 2014. Research Strategies and Methods. In: *An Introduction to Design Science*. Springer International Publishing. pp.39–73. https://doi.org/10.1007/9783-319-10632-8_3.

Joia, L.A. and Lorenzo, M., 2021. Zoom in, zoom out: The impact of the covid-19 pandemic in the classroom. *Sustainability (Switzerland)*, 13(5), pp.1–18. https://doi.org/10.3390/su13052531.

Jones, M.D., Hutcheson, S. and Camba, J.D., 2021. Past, present, and future barriers to digital transformation in manufacturing: A review. *Journal of Manufacturing Systems*, 60, pp.936–948. https://doi.org/10.1016/j.jmsy.2021.03.006.

Patsavellas, J. and Salonitis, K., 2019. The carbon footprint of manufacturing digitalization: Critical literature review and future research agenda. In: *Procedia CIRP*. Elsevier B.V. pp.1354–1359. https://doi.org/10.1016/j.procir.2019.04.026.

Schallmo, D.R.A. and Williams, C.A., 2018. History of Digital Transformation. pp.3–8. https://doi.org/10.1007/978-3-319-72844-5_2.

Trappes, R., Cohnitz, D., Pâslaru, V., Perkins, T.J. and Teymoori, A., 2020. The online alternative: Sustainability, justice, and conferencing in philosophy. *European Journal of Analytic Philosophy*, 16(2), pp.145–172. https://doi.org/10.31820/EJAP.16.2.7.

Truong, T.C., 2022. The Impact of Digital Transformation on Environmental Sustainability. *Advances in Multimedia*, 2022. https://doi.org/10.1155/2022/6324325.

Vats, M.C., Singh, S.K. and Vats, M.C., 2014. *E-Waste Characteristic and Its Disposal*. [online] *International Journal of Ecological Science and Environmental Engineering International Journal of Ecological Science and Environmental Engineering*, Available at: <http://www.aascit.org/journal/ijesee>.

Wickremasinghe, H.T. and Kumuduni, W.Y., 2022. | ijbes.utm.my | eISSN 2289-8948| IJBES. *International Journal of Built Environment and Sustainability*, 9(3), pp.35–46. https://doi.org/10.11113/ijbes.

Comments and agreement from tutor					
Comments (optional):					
I confirm that the project is not work which has been or will be submitted for another qualification and is appropriate.					
Agreed	Yes ☐ No ☐	Name		Date	

Comments and agreement from project proposal checker (if applicable)					
Comments (optional):					
I confirm that the project is appropriate.					
Agreed	Yes ☐ No ☐	Name		Date	

Research Ethics Approval Form

All students conducting research activity that involves human participants or the use of data collected from human participants are required to gain ethical approval before commencing their research. Please answer all relevant questions and note that your form may be returned if incomplete.

Section 1: Basic Details	
Project title:	The environmental impact of digital transformation in zoom platform
Student name:	Ranudi Gayathmie Kariyapperuma
Student ID number:	KIR/X-00104243
Programme:	HND in computing (General)
School:	ESOFT – Metro Campus, Kiribathgoda
Intended research start date:	27.06.2023
Intended research end date:	31.08.2023

Section 2: Project Summary

Please select all research methods that you plan to use as part of your project

- Interviews: ☐
- Questionnaires: ☒ • Observations: ☐
- Use of Personal Records: ☐
- Data Analysis: ☒
- Action Research: ☐ • Focus Groups: ☒
- Other (please specify): ☐ .....

Section 3: Participants

Please answer the following questions, giving full details where necessary. Will your research involve human participants?

Who are the participants? Tick all that apply:

Age 12-16 ☒ Young People aged 17–18 ☒ Adults ☒ How will participants be recruited (identified and approached)?

Describe the processes you will use to inform participants about what you are doing:

Adults actively using Zoom for a variety of reasons in a variety of Sri Lankan sectors will be involved in the research project concentrating on Zoom's environmental impact in that nation. The main methods of recruitment will be outreach via professional networks, internet platforms, and focused email distributions, with the goal of reaching people who are engaged in Zoom-related activities. Prospective participants will also be reached through partnerships with relevant colleges, corporations, and professional groups.

Participants will get a full information sheet detailing the aim, methodology, and use of data acquired in the research, in order to ensure transparency and ethical behavior. The rights of the participants, confidentiality precautions, and voluntary involvement will be highlighted in this text. People will have to give their informed consent before they may join, indicating that they understand and accept to take part. In addition, there will be open lines of communication to answer any questions or concerns participants may have about taking part in the study. Maintaining compliance with ethical guidelines and rules pertaining to research involving human subjects is crucial in order to protect their confidentiality and rights during the investigation.

Studies involving questionnaires:

Will participants be given the option of omitting questions they do not wish to answer?

Yes ☒ No ☐

If **"NO"** please explain why below and ensure that you cover any ethical issues arising from this.

Studies involving observation:

Confirm whether participants will be asked for their informed consent to be observed.

Yes ☐ No ☐

Will you debrief participants at the end of their participation (i.e. give them a brief explanation of the study)?

Yes ☒ No ☐

Will participants be given information about the findings of your study? (This could be a brief summary of your findings in general)

Yes ☒ No ☐

Section 4: Data Storage and Security

Confirm that all personal data will be stored and processed in compliance with the Data Protection Act (1998)

Yes ☐ No ☐

Who will have access to the data and personal information?

During the research:

Where will the data be stored?

Will mobile devices such as USB storage and laptops be used?

Yes ☒ No ☐

If **"YES"**, please provide further details: The data was stored in usb storage because it is easy way to keep this data .

After the research:

Where will the data be stored?

After the study on Zoom's environmental impact in Sri Lanka is over, all of the data that was gathered will be safely kept in designated digital repositories. Strict security protocols will be maintained in these repositories to guarantee the privacy, accuracy, and restricted access of the data that is kept there. To prevent unwanted access, the data will mostly be stored in encrypted databases that use cutting-edge encryption techniques. Furthermore, industry-standard security protocols-compliant secure cloud storage platforms will be employed to ensure data protection and grant the study team permitted access. Password-protected servers will also make the data easier to access, allowing only approved people directly involved in the study endeavor to access it. Institutional policies, security requirements, and the type of data being collected will all influence the storage sites that are selected.

How long will the data and records be kept for and in what format?

The length of time that the records and data gathered from Zoom's environmental impact research in Sri Lanka will be kept in accordance with institutional policies, regulatory obligations, and recognized ethical standards. Research data is usually kept for a certain amount of time after the study is finished. The length of time may differ, spanning from a few years to an unlimited amount of time, depending on the type of data, its significance for prospective follow-up research, and institutional data retention guidelines. Digital formats for storage will guarantee easy access and preservation of these records. Encrypted databases, institutional servers, and secure cloud storage are a few examples of formats that are carefully planned and safeguarded to preserve data integrity and secrecy.The length of time and format in which data is stored will be determined by adherence to ethical standards and data retention

laws. This will protect privacy and preserve the data's accessibility for any future research projects or audits.

Will data be kept for use by other researchers?

Decisions about data accessibility for use by other researchers will be based on participant agreement, institutional policies governing data sharing, and ethical considerations after the study on Zoom's environmental impact in Sri Lanka. We will assess if sharing research data with other researchers is feasible while adhering to legal and ethical criteria for data privacy and confidentiality. If approved and in compliance with participant agreement, other researchers may have access to the data that has been gathered.This access, though, will be controlled to make sure it follows stringent guidelines, like anonymization to protect participant identities and confidentiality. To preserve participant rights and the privacy of the information gathered, cooperation or data sharing with other researchers will require adherence to data sharing agreements, ethical review approvals, and privacy legislation. Ultimately, participant anonymity, institutional policies, and ethical considerations will take precedence when making decisions about sharing study data with other researchers.

Yes ☐ No ☐

If **"YES"**, please provide further details:

Section 5: Ethical Issues

Are there any particular features of your proposed work which may raise ethical concerns? If so, please outline how you will deal with these:

Section 6: Declaration

I have read, understood and will abide by the institution's Research and Ethics Policy:

Yes ☒ No ☐

I have discussed the ethical issues relating to my research with my Unit Tutor:

Yes ☒ No ☐

I confirm that to the best of my knowledge:

The above information is correct and that this is a full description of the ethics issues that may arise in the course of my research.

Name:	Ranudi Gayathmie Kariyapperuma
Date:	31.08.2023

Please submit your completed form to: ESOFT Learning Management System (ELMS)

Higher Nationals

Internal verification of assessment decisions – BTEC (RQF)

INTERNAL VERIFICATION – ASSESSMENT DECISIONS					
Programme title	BTEC HND in Computing				
Assessor	Ms.Gayani Nisansala	**Internal Verifier**	Mr .Lakindu Premachandra		
Unit(s)	Unit 13: Computing Research Project				
Assignment title	Final Research Report – The environmental impact of digital transformation				
Student's name	Ranudi Gayathmie Kariyapperuma				
List which assessment criteria the Assessor has awarded.	**Pass**	**Merit**	**Distinction**		
INTERNAL VERIFIER CHECKLIST					
Do the assessment criteria awarded match those shown in the assignment brief?	Y/N				
Is the Pass/Merit/Distinction grade awarded justified by the assessor's comments on the student work?	Y/N				
Has the work been assessed accurately?	Y/N				
Is the feedback to the student: Give details: • Constructive? • Linked to relevant assessment criteria? • Identifying opportunities for improved performance? • Agreeing actions?	Y/N Y/N Y/N Y/N				
Does the assessment decision need amending?	Y/N				
Assessor signature			**Date**		
Internal Verifier signature			**Date**		
Programme Leader signature (if required)			**Date**		

Confirm action completed			
Remedial action taken Give details:			
Assessor signature		Date	
Internal Verifier signature		Date	
Programme Leader signature (if required)		Date	

Higher Nationals - Summative Assignment Feedback Form

Student Name/ID	Ranudi Gayathmie Kariyapperuma - KIR/X-00104243		
Unit Title	**Unit 13: Computing Research Project**		
Assignment Number	**1**	**Assessor**	
Submission Date	7.11.2023	**Date Received 1st submission**	
Re-submission Date		**Date Received 2nd submission**	

Assessor Feedback:

LO2 Conduct and analyse research relevant to a chosen computing research project

Pass, Merit & Distinction Descripts	**P3** ☐	**P4** ☐	**M2** ☐	**D1** ☐

LO3 Communicate the outcomes of a research project to identified stakeholders

Pass, Merit & Distinction Descripts	**P5** ☐	**M3** ☐	**D2** ☐

LO4 Reflect on the application of research methodologies and concepts

Pass, Merit & Distinction Descripts	**P6** ☐	**P7** ☐	**M4** ☐	**D3** ☐

Grade:	**Assessor Signature:**	**Date:**
Resubmission Feedback:		
Grade:	**Assessor Signature:**	**Date:**
Internal Verifier's Comments:		
Signature & Date:		

* Please note that grade decisions are provisional. They are only confirmed once internal and external moderation has taken place and grades decisions have been agreed at the assessment board.

Assignment Feedback

Formative Feedback: Assessor to Student			
Action Plan			
Summative feedback			
Feedback: Student to Assessor			
Assessor signature		**Date**	
Student signature		**Date**	

Pearson
Higher Nationals in
Computing

Unit 13: Computing Research Project

Project Report

General Guidelines

1. A Cover page or title page – You should always attach a title page to your assignment. Use previous page as your cover sheet and make sure all the details are accurately filled.
2. Attach this brief as the first section of your assignment.
3. All the assignments should be prepared using a word processing software.
4. All the assignments should be printed on A4 sized papers. Use single side printing.
5. Allow 1" for top, bottom , right margins and 1.25" for the left margin of each page.

Word Processing Rules

1. The font size should be **12** point, and should be in the style of **Time New Roman**.
2. **Use 1.5 line spacing**. Left justify all paragraphs.
3. Ensure that all the headings are consistent in terms of the font size and font style.
4. Use **footer function in the word processor to insert Your Name, Subject, Assignment No, and Page Number on each pag**e. This is useful if individual sheets become detached for any reason.
5. Use word processing application spell check and grammar check function to help editing your assignment.

Important Points:

1. It is strictly prohibited to use textboxes to add texts in the assignments, except for the compulsory information. eg: Figures, tables of comparison etc. Adding text boxes in the body except for the before mentioned compulsory information will result in rejection of your work.
2. Avoid using page borders in your assignment body.
3. Carefully check the hand in date and the instructions given in the assignment. Late submissions will not be accepted.
4. Ensure that you give yourself enough time to complete the assignment by the due date.
5. Excuses of any nature will not be accepted for failure to hand in the work on time.
6. You must take responsibility for managing your own time effectively.
7. If you are unable to hand in your assignment on time and have valid reasons such as illness, you may apply (in writing) for an extension.
8. Failure to achieve at least PASS criteria will result in a REFERRAL grade .
9. Non-submission of work without valid reasons will lead to an automatic RE FERRAL. You will then be asked to complete an alternative assignment.
10. If you use other people's work or ideas in your assignment, reference them properly using HARVARD referencing system to avoid plagiarism. You have to provide both in-text citation and a reference list.
11. If you are proven to be guilty of plagiarism or any academic misconduct, your grade could be reduced to A REFERRAL or at worst you could be expelled from the course

Student Declaration

I hereby, declare that I know what plagiarism entails, namely to use another's work and to present it as my own without attributing the sources in the correct form. I further understand what it means to copy another's work.

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5. I acknowledge that the attachment of this document signed or not, constitutes a binding agreement between myself and Pearson , UK.
6. I understand that my assignment will not be considered as submitted if this document is not attached to the assignment.

ranudigk@gmail.com
Student's Signature: **Date: 7.11.2023**
(*Provide E-mail ID*) **(*Provide Submission Date*)**

Higher National Diploma in Computing

Assignment Brief

Student Name /ID Number	Ranudi Gayathmie Kariyapperuma - KIR/X-00104243
Unit Number and Title	Unit 13 – Computing Research Project
Academic Year	2021/22
Unit Tutor	Ms.Gayani Nisansala
Assignment Title	**Final Research Project Report**
Issue Date	8.10.2023
Submission Date	7.11.2023
IV Name & Date	

Submission format

- The submission is in the form of an individual written report.
- The submission is in the form of an individual written report.
- This should be written in a concise, formal business style using single spacing and font size 12.
- You are required to make use of headings, paragraphs and subsections as appropriate, and all work must be supported with research
- referenced using the Harvard referencing system.
- Please provide a referencing list using the Harvard referencing system.
- The recommended word limit is minimum 4,500 words

Unit Learning Outcomes:

LO2. Conduct and analyse research relevant to a chosen computing research project
LO3. Communicate the outcomes of a research project to identified stakeholders
LO4. Reflect on the application of research methodologies and concepts

Assignment Brief and Guidance:

Learner is now required to provide a comprehensive research project report based on the findings of secondary and primary research carried out on the project proposal submitted in the previous section on 'the Environmental Impact of Digital Transformation'.

The Learner requires to produce a detailed research project report covering following areas

- Conduct primary and secondary research using appropriate methods for a computing research project that consider costs, access and ethical issues. Carry out your research and apply appropriate analytical tools to analyse research findings and data and discuss merits, limitations and pitfalls experienced during data collection and analysis.
- Draw conclusion based on the research findings.
- Communicate the outcomes of your research project to the identified audience and a critical evaluation of the outcomes demonstrating if the research objectives were met.
- Reflect on the success of your research project and your performance at the end of the project with the inclusion of a project evaluation and recommendations for future improvements. Consider alternative research methodologies and lessons learnt in view of the outcomes .

The Environmental Impact of Digital Transformation in Zoom Platform

Final Documentation

By

Ranudi Gayathmie Kariyapperuma

KIR/X-00104243

Submitted in accordance with the requirements for the

COMPUTING RESEARCH PROJECT MODULE OF PEARSON'S HND IN COMPUTING PROGRAMME

at the

ESOFT METRO CAMPUS

Name of research Tutor: Gayani Nisansala

7.11.2023

DECLARATION

Name of Research Candidate: Ranudi Gayathmie Kariyapperuma

Pearson Registration Number: KIR/X-00104243

Programme Name: BTEC Higher National Diploma in Computing

Research Title: The Environmental Impact of Digital Transformation in Zoom Platform

Field of Study: The environmental impact of digital transformation

I do solemnly and sincerely declare that:

i. I'm the sole author of this study
ii. This work is original
iii. In case of any use if any information from other sources references of copyright with its ownership have been acknowledged in this document
iv. I do not have any actual knowledge nor do I ought reasonably to know that the making of the work constitutes an infringement of any copyright work
v. I know that plagiarism is a punishable offence because it constitutes theft, I understand the plagiarism and copying policy of the Edexcel UK, I know what the consequences will be if I plagiaries or copy another's work in this research for this program.

Candidate Signature: ranudigk@gmail.com Date: 7.11.2023

Subscribed and solemnly declared before,

Supervisor's Name:

Designation:

Supervisor's Signature: Dat

ACKNOWLEDGMENT

At last author would like to share the experience while doing the project. Author learns many new things about the projects. The best thing which author can share is that author developed more interest in this subject. This Module gave an interest to the author to find more information about it. .

A very special thanks to Miss Gayani who teach us this subject and Author thanks for who helped author to do this kind of project. Thank you!

Regards,

The author,

Ranudi Kariyapperuma.

ABSTRACT

The growing prevalence of digital platforms in daily life has raised worries regarding their environmental effects, which is why researching Zoom's environmental impact in Sri Lanka is essential. With the use of a thorough mixed-methods approach that combines quantitative and qualitative methodologies, this study sets out to explore. By examining carbon emissions, energy consumption trends, and e-waste generation from its operations, the study aims to uncover the complex aspects of Zoom's environmental impact.

The study collects quantitative data on Sri Lankan Zoom users' attitudes, environmental behaviors, and usage trends through well crafted surveys. In addition, to obtain qualitative insights on mitigation strategies, user behaviors, and viewpoints on Zoom's environmental impact, in-depth interviews and case studies are conducted with industry experts, technology players, and environmental advocates.

Strict ethical guidelines underpin the gathering and evaluation of data, including participant privacy, informed permission, and open research procedures. The results of this study seek to both shed light on Zoom's present ecological footprint in Sri Lanka's digital environment and make a significant contribution to the conversation on sustainable technology adoption. Through the identification and dissemination of best practices, the project aims to provide concrete approaches to reduce the environmental impact of digital platforms such as Zoom, thereby promoting a more environmentally responsible attitude to technology progress.

This study, which stands at the nexus of environmental stewardship and technology, seeks to stimulate policy discussions, informed dialogues, and sustainable practices in order to promote the peaceful coexistence of environmental preservation and technological advancement in the digital age.

Contents

LIST OF ABBREVIATIONS

- ICT: Information and Communication Technology
- CO2: Carbon Dioxide
- EIA: Environmental Impact Assessment
- E-waste: Electronic Waste
- GHG: Greenhouse Gas
- UN: United Nations
- CSR: Corporate Social Responsibility
- GDP: Gross Domestic Product
- SMEs: Small and Medium-sized Enterprises
- ISO: International Organization for Standardization

A LIST OF TABLES

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CHAPTER 1 – INTRODUCTION

1.5. **Introduction**

The rise of digital connection, epitomized by Zoom and other platforms, has completely changed the way we communicate and carry out our daily business in both personal and professional contexts. In an increasingly digitalized world, Zoom in particular has become a virtual communication mainstay, enabling continuous connectivity. But a parallel story of environmental worries has emerged with the rise of digital technologies. The complex relationship between technology and its environmental impact has come to light as a result of the increasing data consumption, growing energy demands, and ensuing spike in e-waste creation.

A thorough analysis is required to examine Zoom's impact within Sri Lanka's socio-environmental fabric due to a number of important factors. Zoom is becoming a crucial tool for corporate operations, educational efforts, and social connectivity as the country witnesses a fast upsurge in digital integration across numerous sectors. It is imperative to investigate Zoom's environmental implications in light of this background and the growing emphasis on ecologically sustainable technology practices.

Fundamentally, the goal of this study is to carefully assess the environmental effects that Zoom's operations in Sri Lanka entail. Comprehending the environmental impact of digital platforms, such as Zoom, is essential for guiding the adoption of technology toward responsible and sustainable usage. Understanding how platforms like Zoom affect the environment is crucial to the growth of sustainable technology, particularly as the world faces growing concerns about climate change and environmental damage.

Using a mixed-methods approach that combines quantitative and qualitative techniques, this study aims to provide a comprehensive picture of Zoom's environmental impact. The multifaceted study aims to decipher the complex relationship between Zoom's features and their effects on the environment. This thorough investigation, which aims to uncover complex insights regarding the platform's environmental footprint, centers on factors including carbon emissions, energy usage trends, and the development of electronic waste.

This study is important because it has the potential to establish sustainable technological methods. Through an analysis and explanation of Zoom's present environmental effects, the study hopes to provide useful suggestions for reducing the platform's environmental impact. The envisioned symbiotic relationship between technological innovation and environmental preservation has the potential to influence policy decisions, propel technological progress, and foster responsible personal behavior.

With a focused focus on Sri Lanka's interaction with Zoom, this study aims to make a significant contribution to the worldwide conversation on environmentally conscious technology adoption, going beyond a regional exploration. Beyond a simple study, its goal is to spark important debates, spur legislative changes, and produce concrete initiatives that will help to ensure that technology and environmental sustainability coexist peacefully.

1.6. **Purpose of research**

In Sri Lanka, platforms like Zoom and their effects on the environment are major concerns due to the digital transition. Global data volume is growing exponentially, and this is driving up demand for technology and energy use. Although this growing digital industry offers more efficient computing power, it has a greater environmental impact. Since ICT equipment and services are ubiquitous in daily life, it is imperative to pay more attention to how they affect the environment. It takes a community to combat climate change, and as professionals, it is our duty to look for ways that the digital industry, including websites like Zoom, can lessen its environmental impact. Even with efficiency gains, the digital world is not sustainable, thus new strategies that foster expansion and conform to international climate goals are needed for a more sustainable future.

In terms of research goals in Sri Lanka, students could explore several topics. They could investigate contemporary techniques to reduce carbon emissions in IT networks, assessing their viability and efficiency in Sri Lanka's digital infrastructure. As an alternative, they may concentrate on evaluating the local context-specific environmental effects of cloud data centers, comprehending their influence and possible countermeasures. Examining how e-waste

affects Sri Lanka's digital ecosystem and suggesting ways to control and lessen its environmental effects could be another approach. Finding practical, situation-specific solutions that strike a balance between environmental sustainability and technical growth in Sri Lanka's digital realm would be the main goal of this kind of research.

1.7. **Significance of the Research**

One cannot emphasize how important it is to investigate how digital transformation inside Sri Lankan platforms such as Zoom affects the environment. The expected increase in worldwide data collection would undoubtedly increase the environmental impact due to the corresponding hardware and energy requirements. This urgent issue necessitates careful investigation, particularly considering Sri Lanka, where ICT service integration is becoming more common in a variety of industries. It is essential for sustainability initiatives to comprehend and mitigate these effects.

These kinds of studies provide a useful basis for understanding the subtleties and particularities of environmental consequences in Sri Lanka's digital world. Examining contemporary techniques to reduce carbon emissions in IT networks is consistent with the nation's goal of technical progress with the least amount of environmental impact. Analyzing the effects of cloud data centers also allows for a more nuanced understanding of regional ramifications, which is helpful in developing regional policies for environmental preservation. Furthermore, tackling the problem of e-waste and looking into ways to cut it down directly addresses an increasing issue and provides workable answers for sustainable technological advancement.

Not only is it important to detect the environmental effects, but it is also important to proactively find solutions that balance environmental responsibility with technological progress. The goal of this research is to not only comprehend, but also to steer Sri Lanka's digital future in a more environmentally responsible and sustainable direction. Students can provide insightful ideas and viable solutions through these initiatives, opening the door for a more balanced and environmentally friendly use of digital technology in the nation's development.

1.8. **Research objectives**

- **R01** : Analysis of User Awareness and Occupational Influence on Environmental Impact Perception
- **R02** : Examination of Usage Patterns and Environmental Awareness on Zoom
- **R03** : Evaluation of Energy Consumption Consideration and User Engagement
- **R04** : Analysis of Willingness to Embrace Environmentally Friendly Features on Zoom

1.9. **Research Sub objectives**

1: Evaluation by Comparison

- Comparative Awareness Analysis: Use Zoom to compare the environmental awareness of various professional groups.
- Study of Occupation Influence: Examine how various professional groups view and react to Zoom's environmental .
-

2: Investigation of Behavior and Perception

- Behavioral Analysis: Examine how people from different professional backgrounds use Zoom and how their conduct relates to environmental problems.
- Study on Perception and Attitude: Gain insight into how various professions view Zoom's environmental impact.

3: Methods of Engagement

- Engagement by Occupation: Use Zoom to find efficient ways to encourage various professional sectors to adopt eco-friendly practices.
- Customized Campaign Creation: Create targeted messages for different professional groups according to their Zoom-related environmental concerns.

4: Improvement of the Platform

- Customization and Adaptation: Identify ways to modify Zoom's platform to meet the various environmental requirements of various vocations.
- Feedback and Feature Integration: For ongoing development, include features according to expert demographic findings and get input from users.

1.10. Research questions

Zoom has been a widely used tool in the context of Sri Lanka as a result of the global revolution in communication paradigms brought about by the emergence of digital platforms. Despite Zoom's technological superiority, its operations have resulted in environmental impacts that have prompted thoughtful consideration. With Sri Lanka seeing a rapid digital shift marked by an increased dependence on online platforms such as Zoom in many industries, worries about the environmental effects of this technology use are becoming more and more relevant.

The goal of this study is to understand the complex relationship that exists between Zoom's environmental impact in Sri Lanka and its operation. Fundamentally, the study is centered on a number of basic questions meant to fully comprehend the environmental consequences associated with Zoom's widespread use. These investigations explore the platform's impact on energy consumption trends, carbon emissions, and the production of electronic waste—each of these facets defining a crucial component of its environmental impact.

The examination is being guided by a set of multidimensional research questions in an effort to clarify these aspects. They attempt to interpret both the quantitative and qualitative aspects of Zoom's environmental effect, including its contribution to escalating or alleviating environmental issues in the context of Sri Lanka. By combining meticulous quantitative analysis with detailed qualitative evaluations, the research aims to disentangle the complex processes that underlie Zoom's impact on the environment.

Therefore, in light of the growing environmental consciousness and digital integration, this study aims to answer important problems that cross the boundaries between technology and ecological sustainability. By thoroughly investigating these research questions, this project hopes to provide information that guides tactics for encouraging a more ecologically responsible use of digital platforms such as Zoom in Sri Lanka's socio-environmental context.

As the study of this research author creates 20 research questions to create the form to the research. Above are the questions.

Q1) What's your profession?

Q2) What's your Age ?

Q3) What's your Gender ?

1.How frequently do you use Zoom for communication and collaboration purposes?

2.What types of devices do you primarily use for Zoom sessions?

3.Are you aware of the environmental impact associated with Zoom's operations?

4.Have you considered the energy consumption implications while using Zoom?

5.Would you be willing to adopt energy-saving practices while using Zoom?

6.How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?

7.Do you think Zoom could implement features to reduce its environmental impact?

8.Are you mindful of the potential e-waste generated by technology upgrades necessitated by Zoom?

9.Have you actively sought information about environmentally friendly alternatives to Zoom?

10.Are you inclined to switch to eco-friendly platforms if they were available and efficient?

11.Do you believe cloud-based data storage for platforms like Zoom contributes significantly to environmental issues?

12.How concerned are you about the overall environmental impact of the digital sector's rapid growth?

13.Would you participate in initiatives aiming to reduce e-waste generated by digital platforms like Zoom?

14.How important is it for tech companies to prioritize environmental sustainability in their operations?

15.Are you aware of the current strategies employed by Zoom to minimize its environmental footprint?

16.Would you support government regulations aimed at reducing the environmental impact of digital platforms?

17.Do you consider the environmental impact of Zoom when choosing communication tools?

18.Are you willing to sacrifice certain features or conveniences in Zoom for more environmentally friendly alternatives?

19.Should tech companies be transparent about their environmental impact for user awareness?

20.What measures, if any, have you personally taken to reduce the environmental impact of your digital usage, specifically related to Zoom?

1.11. Hypothesis

H1: As Zoom consumption rises in Sri Lanka, there is a corresponding growth in carbon emissions and the generation of electronic waste, which adds to the environmental impact of the region.

According to the idea, there is a clear correlation between Sri Lanka's use of Zoom and the environmental impact of the area, particularly with regard to carbon emissions and the generation of electronic trash. With Zoom's use becoming more widespread across the nation, there is rising anxiety that the platform's increased use may eventually lead to a rise in carbon emissions and electronic waste. This theory assumes that Zoom has a greater environmental impact the more widely it is used by people and across different industries. If confirmed, this theory would highlight how urgent it is to analyze and deal with the platform's environmental effects in Sri Lanka, requiring a thorough evaluation of its carbon footprint and production of electronic trash.

H2: Zoom users are more likely to be conscious of the platform's environmental impact and show a desire to use eco-friendly habits when using it if they use it more frequently.

This hypothesis is based on the idea that the frequency with which people in Sri Lanka use Zoom is a good indicator of how conscious they are of the platform's environmental impact and how willing they are to use it in an environmentally responsible manner. Should this hypothesis be confirmed, it would indicate that Zoom users who use the site more regularly are probably more aware of the platform's environmental effects. Furthermore, it suggests that these users may take the initiative to implement environmentally responsible practices within the Zoom interface. If confirmed, this theory might lead to customized learning programs or interface changes in Zoom that improve users' understanding of the environment and promote sustainable behaviors.

H3: Users' perceptions of Zoom's environmental impact are greatly influenced by their professional backgrounds; employees and business professionals are more concerned than students about the platform's environmental effects.

This theory proposes a relationship between Zoom users' perceptions of the environmental effects of the platform and their professional backgrounds in Sri Lanka. It expects professionals—workers and businesspeople, for example—to exhibit a higher level of care for Zoom's environmental effects than do students. If validated, this hypothesis would draw attention to how people's perceptions of the environmental effects of technology are shaped by their profession or line of work. This realization could serve as the impetus for focused awareness campaigns or targeted policies that target particular professional groups in an effort to promote more sustainable and thoughtful technology usage practices within their respective fields.

H4: Users who are more conscious of Zoom's environmental impact are more likely to look into eco-friendly communication options in an effort to leave less environmental footprints.

According to the hypothesis, customers of Zoom in Sri Lanka who are more conscious of the company's environmental impact are also more likely to be interested in investigating other environmentally friendly communication platforms. If this theory proves correct, it will highlight how important environmental consciousness is in encouraging a proactive move toward environmentally friendly technology decisions. Additionally, it would highlight how consumers may actively look for and embrace different platforms or adjustments that are more in line with their environmental values, increasing the demand for technical solutions that are more sustainable. This would suggest that in order to meet users' growing worries about the environment, platforms like Zoom would need to take these signals into account and incorporate ecologically friendly features or practices.

1.12. Thesis structure

CHAPTER 1 – Introduction

This thesis's first chapter explores the growing environmental effects of digital transformation, specifically on Sri Lanka's Zoom platform. It displays the world's growing data volume, which is predicted to reach 175 Zettabytes by 2025. This chapter establishes the scene by emphasizing the impending increase in energy and hardware usage, which highlights the growing environmental impact of ICT services. It also highlights the urgent need for coordinated efforts in all domains to tackle climate change, urging experts to actively investigate how the digital industry—including platforms like Zoom—can help address this issue.

CHAPTER 2 - Literature Review

In this section, the effects of the digital revolution on the environment are critically examined, with a focus on platforms similar to Zoom in the Sri Lankan context, as well as studies and scholarly contributions that have already been published. It explores the academic debate on the predicted increase in data generation and storage and how it will lead to increased environmental effect. It seeks to create a thorough understanding of the environmental effects connected to the digital transformation of platforms such as Zoom by utilizing a variety of sources.

CHAPTER 3 – Methodology

This chapter, which focuses on research technique, describes the methodical approach utilized to carry out the study. It outlines the research strategy as well as the data gathering techniques used, such as questionnaires, interviews, and data processing software. In order to guarantee the validity and dependability of the study's conclusions, the chapter highlights the meticulous method used for data collection and analysis.

CHAPTER 4 - Presentation of Results

This section provides an overview of the research activities and presents the conclusions drawn from the data that was gathered and examined. This chapter presents an extensive summary of the study's findings and sheds light on the environmental effects of Zoom's digital transformation in Sri Lanka through in-depth explanations, visual aids, and statistical analysis.

CHAPTER 5 - Conclusions and Recommendations

Based on the results that have been provided, the study synthesizes its findings and makes recommendations that can be put into practice in this concluding chapter. It draws attention to the consequences of the study's findings and makes recommendations for additional studies or programs meant to lessen the negative effects of digital transformation on the environment in Sri Lanka's Zoom platform.

CHAPTER 2 - LITERATURE REVIEW

2.1. Literature Review

The environmental impact of digital transformation in zoom platform

"the use of technology to radically improve the performance or reach of enterprises." was said by MIT Sloan Management ,Westerman et al about the meaning of Digital Transformation so that means how small process will transforming to digital. (Schallmo and Williams, 2018) So if look the history of digital transformation the first revolution was the steam , the second one was the electricity, mass products , division of labor and the third one is the electronics and in that era was found the computer and internet also. So now is the fourth revolution unlike others in present use digital transformation all around the thing all industries such as biological, physical, computing like wise.(Jones, Hutcheson and Camba, 2021)

So in some studies say that there are three generation of the digital transformation .So in this first generation is 1980s that transforms to paperless procedures. In here invented A EDI based port community system. Basically it enables to exchange electronic documents between actors. In 1980 build the first commercial terminal operating system. So these are the main things that build in first generation When go to the second generation it was began between 1190s to 2000s it defines about the transformation to Automated procedures. So in this generation the inventors found laser technologies . Also in 2000 INTTRA was developed. As the study of these 3rd generation was 2010 to today and it shows about the Transformation to smart procedures. In this generation as mentioned in here talks about the beginnings of internet of things, big data, data analytics ,mobile computing and cloud computing. These are three generations of the digital transformation. (Heilig, Schwarze and Voß, n.d.)

So now Author will explain about the Environmental Implications of Digital Transformation. There is a complex relationship between digital transformation and environmental sustainability, and the field of science has discussed whether digital transformation encourages or prevents environmental sustainability.(Truong, 2022) Artificial intelligence (AI), big data analytics, mobile technologies, the Internet of Things (IoT), and social media platforms are examples of digital technologies that benefit both industry and society . Additionally, the improvement of environmental sustainability is utilizing digital technology more and more. Businesses are currently launching innovative digitally-based platforms and solutions to improve environmental sustainability.(Feroz, Zo and Chiravuri, 2021)

Inventors called goralski and Tan were invented a Smart water management system using AI technology. Also their in studies found that most of countries are using big data and IOT devices for build things for environmental sustainability issues and also to improve environment. Also some companies try to use AI,IOT and big data to reduce the carbon emissions and minimize the waste to the environment that is a good thing for the environment as well as the human. For enhancing food system it is better to use Big data analytics for it. Also blockchain is also a useful thing because it can minimize the resource usage and reduce carbon emissions. So this is about the environmental impact on digital transformation.(Feroz, Zo and Chiravuri, 2021)

If address about the local context like zoom adoption in srilanka. In srilanka the online teaching method , online platforms for meetings was not that popular until the Covid pandemic hits for to the country. When Covid pandemic hit the country all the country was lockdown and the business was go down all the industry works were stopped because of this but the IT industry companies doesn't go down because the all work they managed in online way. So all the schools ,companies were switching to do there stuff in online way. All students were teach in online Most probably teachers were used Zoom platform for it because it was easy to handle and easy access to people. Also it can educate with face to face education system. Also for the Medical things online platforms were very useful in that time period. (Joia and Lorenzo, 2021) Also there were some problems such as During the Covid-19 epidemic, these include the lack of typical classroom socialization, reaction times, and direct teacher-student interaction because of the online teaching and learning process. Also some places around the country the students even didn't get to study in online because some places there aren't Data coverage or some students have phones or laptops in rurel places. (Wickremasinghe and Kumuduni, 2022)

Now the explanation about The envioremental impact in Zoom platforms. The ethical implications of greenhouse gas pollution and the responsibilities of governments and individuals to take action to prevent, reduce, and eradicate this pollution that causes extensive harm have been discussed by several theorists as a result of this commitment. One such justification for taking environmental action is provided in a research paper that is "Justice requires you not to harm other people, at least not for your own benefit. Since emissions of greenhouse gas do harm, you should not make them". This was said by John Broome in 2016. (Trappes et al., 2020)

Carbon Footprint of Digital Platforms

The introduction of smartphones with fast fixed broadband and mobile internet has drastically changed how people work, communicate, and consume information.
Notable developments in cellular networking, miniature sensors, new internet connection protocols, and the explosion of mobile software applications have made this possible. Since the first iPhone was released in 2007, mobile internet usage has increased dramatically.once represented the use of manually created spreadsheets and paper printouts, with individuals serving as the data's connecting points across the various software layers that make up a modern enterprise's operational software stack.So all of these things make sense about the enviormental and digital transformation.(Patsavellas and Salonitis, 2019)An important aspect of comprehending the environmental impact of digital platforms like Zoom is research on their energy usage patterns and resultant carbon emissions. Numerous studies have carefully examined these platforms' energy needs, covering a range of operational facets like as data centers, network infrastructure, and user devices. These investigations explore the complex mechanisms of data processing, storage, and transmission that occur during video conferences, offering insights into the energy-intensive operations that add to their carbon footprint.

In addition, scientists have created thorough ways to measure and calculate digital technology's carbon footprint. These methods include carbon accounting frameworks and life cycle evaluations, which help to quantify and assess the environmental effects of using these kinds of platforms. Studies that compare the carbon footprint of various video conferencing platforms have been developed, providing insight into the disparities in the effects on the environment. These studies provide important insights into the ecological effects of digital platforms by examining patterns of energy consumption and using advanced techniques for carbon footprint assessments. These insights can be used to inform strategies for environmentally conscious technology use and conservation efforts.

E-waste Generation and Disposal

Because technology is always evolving, a new waste stream known as EOL (End of Life) or Obsolete Electrical and Electronic Equipment has emerged. These devices were once widely discarded in both developed and developing countries. trash generated into this trash stream is

commonly referred to as "e-waste" globally.The percentage of the cost of treating e-waste to the recovery of materials from it is rather high, and environmental regulations pertaining to recycling, recovery, and disposal are extremely strict in industrialized nations. Due to this high ratio, e-waste is transferred from industrialized to underdeveloped countries, increasing manifolds and promoting informal recycling in developing nations.(Vats, Singh and Vats, 2014) The increased use of digital technology, especially websites like Zoom, has resulted in an alarming rise in the amount of electronic garbage (e-waste). Research on the management of electronic trash within the framework of digital communication networks explores the variety of abandoned gear, gadgets, and accessories. Determining the kind and amount of e-waste produced by these platforms is essential to developing efficient plans for recycling, disposal, and responsible end-of-life handling. The literature in this field underscores the negative effects that uncontrolled e-waste has on the environment and stresses the pressing need for recycling programs and sustainable disposal techniques to lessen those effects.

User Awareness and Behavioral Impact

Studies examining how users, especially Zoom users, perceive and act in relation to the environmental effects of technology offer important new perspectives on their awareness and attitudes. These studies explore how consumers understand and interpret the environmental consequences associated with digital platforms, including carbon emissions, energy use, and the production of e-waste. Designing educational campaigns and interventions targeted at promoting sustainable practices requires an understanding of how much this awareness effects user behavior during platform usage. The research's insights make it easier to create usercentered methods that encourage eco-conscious behavior and well-informed decision-making.

Corporate Sustainability and Responsibility

Research on the CSR programs of technology businesses—including those running platforms such as Zoom—reveals how committed these organizations are to environmental sustainability. The literature in this area examines the tactics, guidelines, and measures that tech companies have taken to reduce their environmental impact. Assessing these programs provides important information on how companies might support environmentally friendly activities, shape

industry norms, and encourage the use of sustainable technologies. Comprehending the influence and efficacy of these business ventures is essential to promoting industry-wide sustainability initiatives and legislative advancements.

Energy Efficiency and Innovation

Research on energy-saving techniques and advances in digital platforms—particularly with regard to Zoom and related tools—contributes much to environmental initiatives. This field of study looks into new features, technology, or infrastructure improvements that can lower energy use and their impact on the environment. Through the examination of energy efficiency developments on these platforms, researchers significantly influence the direction of sustainable technology. Greener technical developments are encouraged by the insights gained from these research, which not only help eco-friendly methods evolve but also force a movement in the digital arena towards the wider adoption of sustainable ways.

2.2. **Conceptual framework**

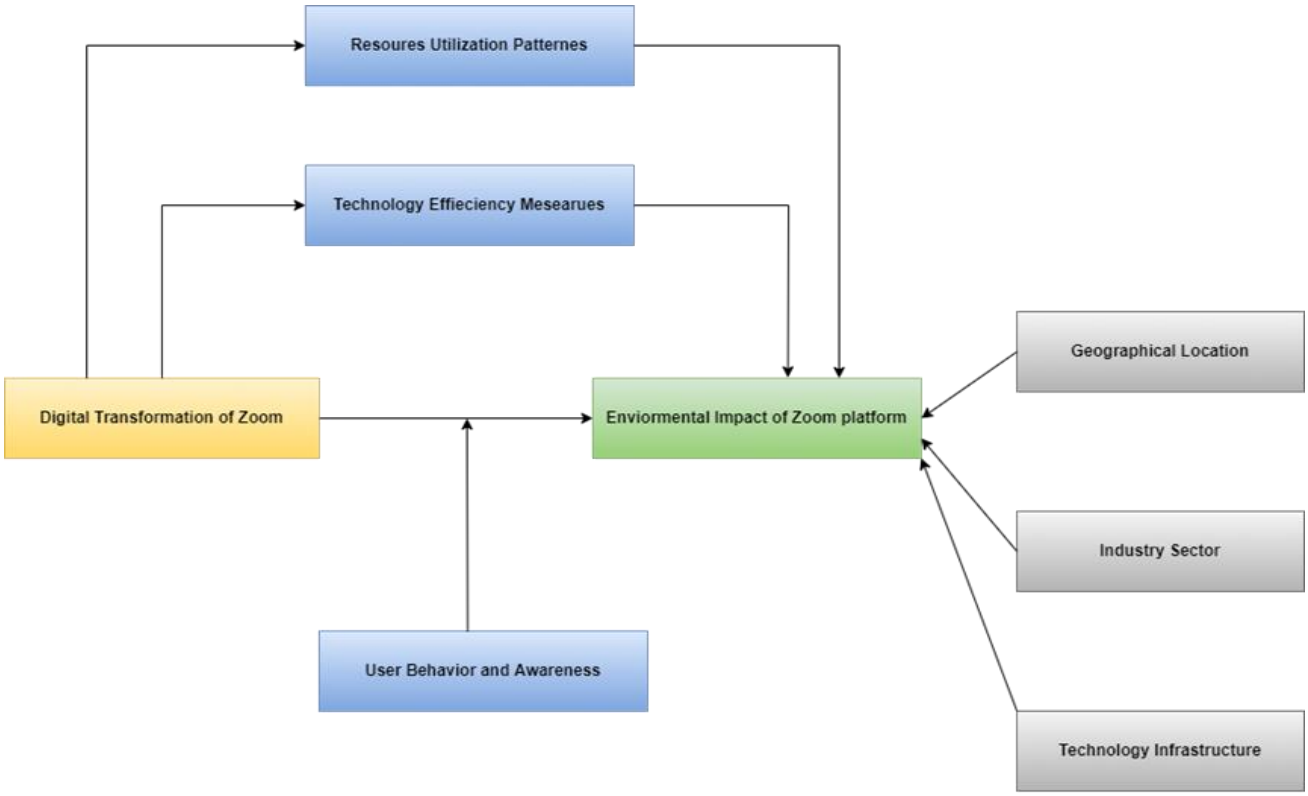


Figure 1 : Conceptual Framework

Independent Variable

The "Digital Transformation Level" is the independent variable in this instance. This variable measures the degree to which regions or companies have adopted and put into effect digital transformation strategies, especially when using the Zoom platform. It includes a thorough evaluation of how digital technologies—including Zoom—are incorporated and used into operational frameworks and procedures.

Dependent Variable

The "Environmental Impact" has been designated as the dependent variable. This variable denotes the overall environmental effects that result from the adoption and application of digital transformation procedures that make use of the Zoom platform. It includes a wide range of environmental effects, such as resource use, energy consumption, carbon emissions, and ecological footprints brought about by digital transformation activities..

Mediator Variables

- Technological Efficiency Measures

"Technological Efficiency Measures" is the first Mediator Variable. These include intentional tactics, systems, or technology additions made as part of Zoom's digital transformation effort. The principal objective is to optimize resource allocation, lower carbon emissions, or improve energy efficiency in order to minimize the total environmental effect associated with digital transformation activities.

- Resource Utilization Patterns:

"Resource Utilization Patterns" is an additional mediator variable. This variable focuses on assessing and comprehending the allocation, utilization, and management of diverse resources (such as energy, hardware, etc.) during the Zoom-enabled digital transformation process. It looks for and examines resource usage patterns or trends that could have a big influence on the way the digital transformation process affects the environment.

- User Behavior and Awareness:

The third variable that was found as a mediator is "User Behavior and Awareness." This variable examines how users use the Zoom platform in the context of digital transformation in

terms of their behaviors, attitudes, knowledge, and awareness of environmentally conscious practices. It looks at how user choices, actions, and awareness levels affect how digital transformation processes affect the environment.

Control Variables

- Geographical Location

  "Geographical Location" is one of the Control Variables. This variable attempts to address and control for differences in energy sources, infrastructure, and environmental legislation across various countries or geographical regions where Zoom is used in digital transformation techniques. It takes into consideration regional differences that could affect environmental results.

- Industry Sector

  "Industry Sector" is an additional control variable. Zoom-based digital transformation processes have an impact on the environment; variations in industry-specific practices, standards, and regulations are taken into account and controlled by this variable. It recognizes that depending on how they operate, different industry sectors may have different environmental footprints.

- Technological Infrastructure Standards

  "Technological Infrastructure Standards" has been selected as the third control variable. This variable takes into account rules, norms, or standards that affect environmental practices and technology infrastructure in relation to digital transformation operations that use the Zoom platform. It serves to adjust for differences in infrastructure that could have an impact on environmental results.

CHAPTER 3 - METHODOLOGY

3.1. Research philosophy

For this study, pragmatism in research philosophy may be especially helpful because of its focus on problem-solving and practicality. A practical strategy can combine quantitative and qualitative techniques in light of the difficulties involved in evaluating Zoom's environmental impact in Sri Lanka. This combination may include quantitative measurements of carbon emissions, energy usage patterns, and the creation of e-waste associated with Zoom's activities. Concurrently, Zoom users' attitudes, behaviors, and perceptions of environmental sustainability could be investigated by qualitative techniques such as focus groups, interviews, and user surveys. A comprehensive knowledge is made possible by this combination, which explores the attitudes and behaviors of the corporations and users involved in addition to measuring the environmental impact.

Within the range of research philosophies, positivism provides a systematic framework for measuring and evaluating concrete data. Following this line of thinking would probably include analyzing historical data on energy use and e-waste creation linked to Zoom in Sri Lanka using statistical models. By applying quantitative techniques, it might produce statistical correlations or predictive models linking Zoom usage to environmental effects, offering a more precise numerical picture of the platform's long-term effects.

Conversely, using an interpretivist perspective may provide valuable understanding of the personal encounters and viewpoints of people engaging with Zoom in Sri Lanka. This method could examine narratives, attitudes, and beliefs around environmental issues associated to digital platforms by delving deeper into qualitative data. Research using interviews or ethnographic research may reveal subtle differences in users' perceptions of Zoom's influence as well as reasons for or obstacles to using the platform to adopt more environmentally friendly behaviors.

The implementation of each research philosophy has the potential to greatly alter the direction, methods, and results of the study on Zoom's environmental impact in Sri Lanka. Each research philosophy has its own advantages and disadvantages. Selecting the best philosophy requires taking into account the complexity of the study subject as well as the level of comprehension and insight that is needed.

3.2. **Research approach**

The plan or strategy that describes the research approach will direct the data collecting, analysis, and interpretation phases of the project. A mixed-methods study technique may prove beneficial in examining Zoom's environmental impact in Sri Lanka.With the use of both qualitative and quantitative methodologies, this mixed-methods approach provides a thorough understanding of the complex issues surrounding Zoom's environmental impact in Sri Lanka.

The measurement and analysis of numerical data related to Zoom's environmental impact would be made possible by quantitative approaches. This could entail quantitative evaluations of the generation of e-waste associated with Zoom's operations, statistical analyses of energy consumption trends, and carbon emissions. Zoom usage and its ecological effects can be better understood and patterns or connections can be found by quantifying these features.
Concurrently, qualitative approaches like focus groups, interviews, or ethnographic research could explore users' subjective experiences, beliefs, and actions concerning Zoom's influence on the environment. These qualitative methods provide important context and insight beyond quantitative data by enabling a deeper investigation of users' attitudes, motivations, and difficulties with regard to eco-friendly habits when using Zoom.

By combining several approaches, one can take advantage of the advantages of each strategy while making up for the shortcomings of the others. Zoom's environmental impact in Sri Lanka can now be better understood thanks to this comprehensive approach, which takes into account both quantitative metrics and qualitative user insights. It also provides a thorough foundation for developing suggestions or countermeasures to lessen the environmental impact of the platform.

Methodologies

Using a quantitative approach, the study will conduct in-depth interviews with Zoom users in Sri Lanka in order to get quantitative information about their usage habits, patterns of energy consumption, and the amount of e-waste they produce as a result of Zoom's operations. throughout addition, calculations and existing models will be employed to approximate and measure energy usage and carbon emissions resulting from Zoom's operations throughout the nation. In addition to the quantitative component, qualitative methods such as focus groups and in-depth interviews with technology players, industry experts, and environmental advocates

will be used. Through these qualitative interviews, important information on user behavior, effective methods, and mitigation techniques related to Zoom's environmental effect is intended to be gleaned. An examination of relevant case studies will yield insightful actual instances of environmentally conscious business strategies that technology businesses in Sri Lanka have successfully adopted.

Research Onion

Platforms like Zoom are at the forefront of global connectivity thanks to the rapidly evolving communication technologies that define the developing digital world. Concerns about these digital platforms' effects on the environment are growing as their use does. As data consumption and infrastructural demands are expected to rise, the environmental impact of these technologies comes under closer examination. Using an onion research methodology to sift through the layers of Zoom's environmental impact, this study aims to examine and expose the ecological ramifications of the company's operations in Sri Lanka.

Understanding the Onion Research Methodology

In keeping with an objective ontology, the goal of this study is to conduct an objective analysis of Zoom's environmental effects in Sri Lanka. The aim is to evaluate the concrete environmental effects that result from Zoom's operations, which are based on factual and empirical data. From an epistemological point of view, the research combines quantitative and qualitative methods to create a detailed account of Zoom's environmental impact. Through the integration of quantitative data and qualitative perspectives, this methodology seeks to provide a comprehensive understanding of Zoom's environmental impact on Sri Lanka's digital landscape.

The study strategy uses a logical approach, exploring current hypotheses on how digital platforms affect the environment. The study intends to evaluate and validate the applicability of these ideas in the particular context of Zoom's operations in Sri Lanka through empirical data collection methods that include structured surveys, interviews, and case studies.

Through the application of the Onion Research Methodology, this study aims to clarify Zoom's current ecological footprint in Sri Lanka by dissecting the various layers of its environmental impact. Using a cross-sectional methodology, this analysis seeks to provide an overview of

Zoom's environmental effects, including aspects of energy use, carbon emissions, e-waste production, and mitigation tactics. The study's methodology includes the use of structured questionnaires to collect qualitative insights through thematic analysis and interviews as well as quantitative data, allowing for a multifaceted investigation.

Onion Research Methodology

- Philosophy

  This study technique, which is based on facts and observable reality and adopts an objective ontology, aims to conduct an unbiased investigation into Zoom's environmental impact in Sri Lanka. The objective of this assessment is to evaluate Zoom's operations' ecological effects in an unbiased and objective manner, facilitating an open and thorough investigation.

- Epistemology

  This strategy combines quantitative and qualitative methods in an epistemologically sound way to improve our comprehension of Zoom's environmental impact. It seeks to create a complete picture that encompasses Zoom's ecological footprint in Sri Lanka in both its width and depth by fusing hard data with in-depth qualitative perspectives.

- Approach

  The study strategy takes a deductive approach, starting with accepted ideas and body of information about the environmental effects of digital platforms. Through the use of empirical data gathering techniques including surveys, interviews, and case studies, it aims to confirm if these theories are applicable to Zoom's operations in the Sri Lankan environment.

- Time Horizon

  This study's cross-sectional investigation of Zoom's current environmental impact in Sri Lanka is focused on the study's temporal horizon. It attempts to depict the present situation of environmental effects linked to Zoom's operations, providing an overview of its ecological footprint.

- Techniques

  The project will gather and evaluate data using semi-structured interviews, formal surveys, and theme analysis. Quantitative data gathering is facilitated by structured surveys, whilst

qualitative issues such as user behaviors, mitigation techniques, and environmental viewpoints related to Zoom's operations in Sri Lanka can be further explored through interviews and thematic analysis.

- limitations and Adaptations

  This methodology acknowledges that the research findings reflect a specific moment in time and may not capture longitudinal changes, in keeping with the constraints of a cross-sectional study. As a result, it is still flexible enough to allow for future adjustments and iterative methodological improvements to take into account new information and shifts in Zoom's operational environment.

- Digital Survey Data Collection

  Online surveys provide a means of gathering large amounts of data in the digital age. This method makes use of web-based questionnaires specifically designed for Zoom users in Sri Lanka, which makes it easier to collect quantitative information about Zoom's impact and its usage patterns as well as environmental behaviors and perceptions. These surveys allow for widespread participation and reach a variety of user groups around the nation. They can be sent by email invitations, social media platforms, or specialized online forums. A wider range of responders can be accommodated while maintaining uniformity in data acquisition because to the digital format's ability to collect organized and standardized responses. The research can effectively gather the quantitative data required for evaluating Zoom's environmental impact by utilizing online survey technologies.

- Virtual Interviews and Focus Groups Provide Qualitative Information

  Virtual focus groups and interviews are useful tools for gathering qualitative information about Zoom's environmental impact in Sri Lanka. Through the use of video conferencing services, it is possible to arrange interviews with technological players, environmental campaigners, and industry experts while overcoming geographical limitations and promoting in-depth talks. Participants can share thoughts, strategies, and experiential knowledge about Zoom's environmental footprint through these sophisticated virtual engagements. Furthermore, virtual focus groups provide a cooperative setting where a range of viewpoints can come together, stimulating meaningful discussions and revealing qualitative information on user behavior, mitigation techniques, and environmental viewpoints in the digital space.The adaptability and

accessibility of the digital medium aid in the thorough qualitative data collecting necessary to comprehend the nuances of Zoom's influence.

- Utilizing Digital Tools for Analysis and Visualization

  A wide range of software and tools are available in the digital realm for reliable data analysis and visualization, which is essential for processing and presenting research findings. Statistical software can be effectively utilized to handle quantitative data obtained from online surveys. This allows for a thorough examination of usage trends, energy consumption patterns, and e-waste generation that can be traced back to Zoom's operations. Additionally, utilizing specialist software, qualitative insights from focus groups and virtual interviews can be subjected to thematic analysis, which can help discover reoccurring motifs and extract important narratives.

3.3. **Research strategy**

Research study means a that plan for study for the research. In a strategy there is a way to plan ,execute and also monitor them. Always research strategy should have to suite to the purpose of the research as a example of authors research the purpose of the research is to find the envioremental impact in zoom platform like that. So as a researcher for the research strategy needs to search about data sources, find information other peoples documents also need to have computer software analysis in some times.(Johannesson and Perjons, 2014)

This study aims to investigate how the digital transformation—specifically, Zoom use in Sri Lanka—affects the environment. A multifaceted study approach is suggested in order to fully understand the intricacies and repercussions of this influence. This methodology combines quantitative and qualitative approaches to offer a thorough comprehension of the connection between the growth of digital technology, energy use, and environmental effects.Now athour will explain the quantitative research methodology and Qualititative reserach methodology.

Quantitative rsearch methodology.

In quatitative there are quanitative surveys.This approach is popular in business research since it gives access to a sizably large number of people. The organization of the responses and the widespread and affordable distribution of surveys are made possible by the availability of internet websites.

While creating questions can seem simple, creating a relevant questionnaire that enables research questions to be answered is challenging.Respondents must find questionnaires interesting; they cannot be overly drawn out, invasive, or challenging to grasp. They must also

precisely measure the problem they are looking into. For these reasons, it is also advised to employ commercially accessible surveys that have undergone extensive validation wherever feasible. (Abuhamda and Bsharat, 2021)

When collecting quantitative data, the research will make use of reputable studies and sources to examine trends in energy consumption in the digital industry, global data growth forecasts, and particular statistics pertinent to Sri Lanka's technological environment.

Qualitative research methodology

In qualitative research uses interviews.Qualitative interviews come in a variety of forms (structured, semi-structured, unstructured, etc.), and they are the most popular way to collect data. Rich information can be obtained through interviews. They need careful planning in order to establish the framework, choose which people to interview and how, and decide whether to perform solo or group interviews.(Abuhamda and Bsharat, 2021)

In qualitative research use interviews with many stakeholders, such as IT experts, organization and Zoom users in Sri Lanka. Within the Zoom platform, this qualitative method seeks to investigate attitudes, behaviors, and knowledge about the environmental effects of digital transformation.

Sampling strategy

The sampling approach entails choosing a representative sample of individuals, organizations, and institutions from various sectors in Sri Lanka. This diverse representation aims to provide a thorough understanding of Zoom usage trends, environmental consciousness, and technological practices across many industries and demographic groups.

Both independent and dependent variables are included in the identified variables. Data growth, hardware expansion, and power consumption are examples of independent variables, and environmental impact, concerns about climate change, and the adoption of eco-friendly methods are examples of dependent variables. The relationship between the expansion of digital technology and its environmental effects is influenced by control variables such as technological breakthroughs, user awareness campaigns, and regulatory rules.

Many methods will be used in data analysis. Data growth trends will be quantified by statistical analysis, which will also evaluate the relationship between data growth and environmental impact. Thematic analysis will be employed to discover recurrent patterns and themes in user

perceptions and practices concerning environmental consciousness and technology usage, based on qualitative data.

Throughout the entire study process, ethical issues will be crucial, guaranteeing informed consent, confidentiality, and moral behavior when gathering and analyzing data. The confidentiality and privacy of participants shall be respected in order to uphold moral principles.

The research approach recognizes certain drawbacks, including biases in data sources, difficulties obtaining particular data, and underlying presumptions about the complex interplay between environmental effect and digital expansion. These factors will be taken into account in order to present an impartial and thorough analysis of the environmental effects of Zoom's digital transformation in the context of Sri Lanka.

3.4. **Research Choice**

Zoom's digital transformation in Sri Lanka has an impact on the environment that needs to be studied from all angles. The goal of this study project is to determine the environmental effects of Zoom's extensive use in the nation's digital environment. It entails a thorough analysis of how Zoom, a crucial digital communication tool, affects carbon emissions, energy use, and environmental sustainability in general within Sri Lanka's socioeconomic context.

In order to find links between digital transformation strategies and environmental impact, the study will examine Zoom usage trends, technological efficiency metrics, and user behaviors. Through an examination of these characteristics, the study aims to clarify the complex relationship between Zoom's digital revolution and its effects on Sri Lanka's environmental landscape, facilitating the development of well-informed initiatives.

3.5. **Time frame**

The study of Zoom's digital revolution and its effects on Sri Lanka's environment is meticulously organized into discrete stages outlined in a comprehensive timeline. During the first eleven weeks, the proposal is developed. This includes creating the introduction, problem statement, objectives, and sub-questions of the research as well as methodological planning, literature review, ethical framework establishment, resource estimation, and obtaining the necessary approvals. After that, there is a seven-week study execution phase that includes creating and distributing a questionnaire, gathering data, analyzing it, drawing conclusions from the results, and creating useful suggestions. Lastly, a full week is set aside to draft the thorough research report that summarizes all of the findings and conclusions from the investigation. This well-organized timetable guarantees an organized and comprehensive investigation of Zoom's environmental impact, enabling informed judgments and suggestions for sustainability within Sri Lanka's

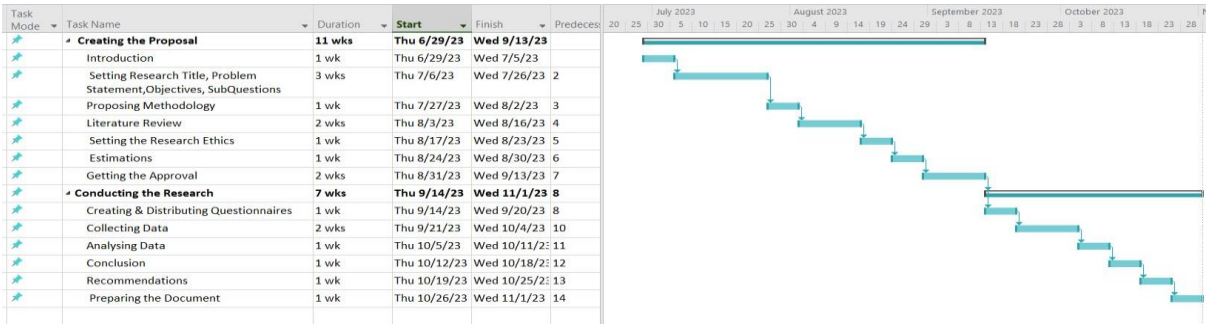
Activities and Time frame

Activities	Time frame
Creating the Proposal	**11 Weeks (2 Months and 1 Week)**
Introduction	1 Weeks
Setting Research Title, Problem Statement, Objectives, Sub Questions	3 Weeks
Proposing Methodology	1 Week
Literature Review	2Weeks
Setting the Research Ethics	1 Week
Estimations	1 Week
Getting the Approval	2 Weeks
Conducting the Research	**7 Weeks (1 Month and 2 Weeks)**
Creating & Distributing Questionnaires	1 Week
Collecting Data	2 Weeks
Analysing Data	1 Week
Conclusion	1 Week

Recommendations	1 Week
Preparing the Document	1 Week

Table 1 : Time Frame

Gantt Chart of Time Frame



Task Mode	Task Name	Duration	Start	Finish	Predeces
	Creating the Proposal	**11 wks**	**Thu 6/29/23**	**Wed 9/13/23**	
	Introduction	1 wk	Thu 6/29/23	Wed 7/5/23	
	Setting Research Title, Problem Statement,Objectives, SubQuestions	3 wks	Thu 7/6/23	Wed 7/26/23	2
	Proposing Methodology	1 wk	Thu 7/27/23	Wed 8/2/23	3
	Literature Review	2 wks	Thu 8/3/23	Wed 8/16/23	4
	Setting the Research Ethics	1 wk	Thu 8/17/23	Wed 8/23/23	5
	Estimations	1 wk	Thu 8/24/23	Wed 8/30/23	6
	Getting the Approval	2 wks	Thu 8/31/23	Wed 9/13/23	7
	Conducting the Research	**7 wks**	**Thu 9/14/23**	**Wed 11/1/23**	**8**
	Creating & Distributing Questionnaires	1 wk	Thu 9/14/23	Wed 9/20/23	8
	Collecting Data	2 wks	Thu 9/21/23	Wed 10/4/23	10
	Analysing Data	1 wk	Thu 10/5/23	Wed 10/11/2	11
	Conclusion	1 wk	Thu 10/12/23	Wed 10/18/2	12
	Recommendations	1 wk	Thu 10/19/23	Wed 10/25/2	13
	Preparing the Document	1 wk	Thu 10/26/23	Wed 11/1/23	14

Figure 2 : Gantt chart of time frame

3.6. Data collection procedures

3.6.1. Type of Data

An technique to data gathering that combines both quantitative and qualitative methods is used in the study on the environmental effects of digital transformation in Sri Lanka using the Zoom platform.

Quantitative Data Collection: This aspect deals with statistics, measurable measurements, and numerical data. It can involve compiling precise data on patterns of energy use linked to Zoom use, measuring carbon emissions from digital activity, and analyzing statistical trends in the uptake of environmentally friendly features. Numerical values and statistical trends will be crucial in measuring and comprehending the scope of environmental impact brought about by digital transformations in Sri Lanka through surveys, questionnaires, or current data analysis.

Qualitative Data Collection: On the other hand, qualitative data is more concerned with personal opinions, insights, and a deeper comprehension of user behavior. Through the use of descriptive data collection, this approach seeks to understand users' understanding of the environmental effects associated with Zoom's operations, as well as their attitudes toward implementing energy-saving measures and identifying subtleties in their actions related to ecoconsciousness. Comprehensive narratives and subjective points of view can be captured with the aid of methods like focus groups, interviews, and open-ended survey questions, which will yield rich contextual data regarding the environmental impact.

The combination of quantitative and qualitative data approaches ensures a comprehensive approach for fully understanding the various aspects of environmental concerns stemming from Sri Lanka's digital transformation. This combination makes it possible to conduct an advanced analysis that combines environmental understanding with statistical information, making the study more thorough and insightful overall.

3.6.2. Data Collection Method

Using Google Forms was the main technique of data gathering used in Zoom's investigation of the environmental effects of digital transformation in Sri Lanka. This easy-to-use online survey tool made it easier to create structured questions specifically designed to collect quantitative data. The purpose of these surveys was to gather various viewpoints on Zoom users' awareness of environmental implications, usage patterns, and propensity to adopt eco-friendly practices on the platform. The accessibility and ease of dissemination of Google Forms were crucial in reaching a wide audience and guaranteeing respondents' convenience in efficiently contributing their ideas.

In addition to the Google Forms questionnaires, other methods of data gathering were utilized in order to fully enhance the research dataset.In order to get real-time insights into users' environmental consciousness, observational studies were also used to watch and examine user behaviors and practices during digital interactions on the platform.

A qualitative view was provided by content analysis of user groups, social media conversations, and online forums by examining conversations about the environmental effects of digital transformations on the Zoom platform. In addition, the analysis of previous data sources, such as energy consumption figures and environmental reports, provided insightful secondary quantitative data to support the main research conclusions. With the use of both quantitative and qualitative data, our multimodal data collection strategy attempted to produce an extensive dataset that would provide a full picture of the environmental effects of Zoom's digital transformation in Sri Lanka.

3.6.3. Data Collection and Analyze Tools

Using Google Forms, which provides an easy-to-use interface for structured surveys, was the primary method of data collecting used in the study on the environmental effects of digital transformation in Sri Lanka through the Zoom platform. The author used the statistical package for the social sciences, or SPSS, software to improve the research and analyze the data that was

collected. Google Forms made it easier to collect quantitative data in an organized manner, providing insights into Zoom users' views toward eco-friendly behaviors, environmental awareness, and usage patterns.

After the quantitative data was gathered using Google Forms, it was processed and thoroughly analyzed using SPSS software. Descriptive statistics, correlation analysis and regression are only a few of the analytical procedures that may be carried out by the researcher using the powerful statistical analysis platform that SPSS offers. Large datasets can be manipulated and interpreted with the help of this software, which also makes it easier to find patterns, correlations, and statistical significance in the data that has been gathered.

The smooth workflow created by integrating Google Forms for data collection and SPSS for data analysis made sure that the quantitative insights obtained from the surveys were processed and interpreted effectively. By enabling thorough analysis and interpretation of the gathered data, this combined methodology provided a greater understanding of the environmental impact of Zoom's digital transformation as it took place in Sri Lanka.

3.6.4. **Questionnaire structure**

Variable	Indicators	Measurement	Mean	STD. Deviation	Median
Profession	Q1) What's your profession?	• A School student • AnUndergraduate • An Employee • Other	2.32	.768	2.00
Age	Q2) What's your Age ?	• 15 – 17 • 18 -25 • 26-35 • 36-45 • 45-55	2.41	.988	2.00
Gender	Q3) What's your Gender ?	• Male • Female	1.50	.508	1.50
Zoom Usage Frequency	1. How frequently do you use Zoom for communication and collaboration purposes?	• Daily • Several times a week • Once a week • Rarely	3.21	1.008	4.00
Types of Devices for Zoom	2.What types of devices do you primarily use for Zoom sessions?	• Laptop/PC • Smartphone/Tablet • Other (please specify)	1.41	.701	1.00

Awareness of Zoom's Environmental Impact	3.Are you aware of the environmental impact associated with Zoom's operations?	• Yes, very aware • Somewhat aware • No, not aware	1.85	.744	2.00
Consideration of Energy Consumption	4.Have you considered the energy consumption implications while using Zoom?	• Yes, always • Sometimes • No, never	2.03	.666	2.00
Willingness to Adopt Energy-saving Practices	5.Would you be willing to adopt energy-saving practices while using Zoom?	• Yes, definitely • Maybe, if it's convenient • No, not interested	1.74	.666	2.00
Knowledge about Carbon Footprint	6.How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?	• Very knowledgeable • Moderately knowledgeable • Not knowledgeable at all	2.18	.716	2.00
Opinion on Zoom Implementing Features for Environmental Impact	7.Do you think Zoom could implement features to reduce its environmental impact?	• Yes, definitely • Maybe, if it doesn't affect usability • No, unnecessary	1.76	.606	2.00

Awareness of E-waste Due to Zoom	8.Are you mindful of the potential e-waste generated by technology upgrades necessitated by Zoom?	• Yes, very mindful • Somewhat mindful • No, not mindful	1.74	.666	2.00
Seeking Environmentally Friendly Alternatives to Zoom	9.Have you actively sought information about environmentally friendly alternatives to Zoom?	• Yes, actively seeking • Sometimes, but not extensively • No, not at all	1.97	.758	2.00
Inclination to Switch to Eco-friendly Platforms	10.Are you inclined to switch to eco-friendly platforms if they were available and efficient?	• Yes, definitely • Maybe, if they have similar features • No, satisfied with current options	1.56	.613	1.50
Cloud-based Data Storage Impact	11.Do you believe cloud-based data storage for platforms like Zoom contributes significantly to environmental issues?	• Yes, it has a substantial impact • Moderately, but not significantly • No, it has negligible impact	1.88	.729	2.00

Concern about Digital Sector's Environmental Impact	12.How concerned are you about the overall environmental impact of the digital sector's rapid growth?	• Very concerned • Somewhat concerned • Not concerned at all	1.94	.600	2.00
Willingness to Participate in E-waste Reduction Initiatives	13.Would you participate in initiatives aiming to reduce e-waste generated by digital platforms like Zoom?	• Yes, definitely • Maybe, depending on the initiative • No, not interested	1.74	.567	2.00
Importance of Environmental Sustainability for Tech Companies	14.How important is it for tech companies to prioritize environmental sustainability in their operations?	• Very important • Moderately important • Not important	1.50	.615	1.00
Awareness of Zoom's Environmental Strategies	15.Are you aware of the current strategies employed by Zoom to minimize its environmental footprint?	• Yes, well aware • Partially aware • No, not aware at all	1.97	.717	2.00
Support for Government Regulations	16.Would you support government regulations aimed at reducing the environmental impact of digital platforms?	• Yes, strongly support • Maybe, if they are well-balanced • No, I prefer less regulation	1.56	.615	1.00

Considering Environmental Impact when Choosing Communication Tools	17.Do you consider the environmental impact of Zoom when choosing communication tools?	• Always • Sometimes • Never	1.94	.649	2.00
Willingness to Sacrifice Features for Environmentally Friendly Alternatives	18.Are you willing to sacrifice certain features or conveniences in Zoom for more environmentally friendly alternatives?	• Yes, definitely • Maybe, if the trade-off is reasonable • No, I prefer convenience over environmental considerations	1.68	.589	2.00
Transparency of Tech Companies About Environmental Impact	19.Should tech companies be transparent about their environmental impact for user awareness?	• Yes, absolutely • Maybe, if it doesn't affect their business • No, it's unnecessary •	1.62	.697	1.50
Personal Measures to Reduce Environmental Impact of Digital Usage	20.What measures, if any, have you personally taken to reduce the environmental impact of your digital usage, specifically related to Zoom?	• Reduced usage frequency • Optimized settings for energy efficiency • Explored alternative eco-	2.26	1.024	2.00

		friendly platforms • No specific measures taken			

Table 2 : Questionaries

Frequencies

Statistics

		What's your Gender ?	What's your profession?	What's your Age ?	1.How frequently do you use Zoom for communication and collaboration purposes?	2.What types of devices do you primarily use for Zoom sessions?	3.Are you aware of the environmental impact associated with Zoom's operations?	4.Have you considered the energy consumption implications while using Zoom?	5.Would you be willing to adopt energy-saving practices while using Zoom?	6.How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?	7.Do you think Zoom could implement features to reduce its environmental impact?	8.Are you mindful of the potential e-waste generated by technology upgrades necessitated by Zoom?	9.Have you actively sought information about environmentally friendly alternatives to Zoom?
N	Valid	34	34	34	34	34	34	34	34	34	34	34	34
	Missing	1	1	1	1	1	1	1	1	1	1	1	1
Mean		1.50	2.32	2.41	3.21	1.41	1.85	2.03	1.74	2.18	1.76	1.74	1.97
Median		1.50	2.00	2.00	4.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Std. Deviation		.508	.768	.988	1.008	.701	.744	.577	.666	.716	.606	.666	.758

Figure 3 : SPSS software analyzing of Questions part 1

10.Are you inclined to switch to eco-friendly platforms if they were available and efficient?	11.Do you believe cloud-based data storage for platforms like Zoom contributes significantly to environmental issues?	12.How concerned are you about the overall environmental impact of the digital sector's rapid growth?	13.Would you participate in initiatives aiming to reduce e-waste generated by digital platforms like Zoom?	14.How important is it for tech companies to prioritize environmental sustainability in their operations?	16.Would you support government regulations aimed at reducing the environmental impact of digital platforms?	15.Are you aware of the current strategies employed by Zoom to minimize its environmental footprint?	17.Do you consider the environmental impact of Zoom when choosing communication tools?	18.Are you willing to sacrifice certain features or conveniences in Zoom for more environmentally friendly alternatives?	19.Should tech companies be transparent about their environmental impact for user awareness?	20.What measures, if any, have you personally taken to reduce the environmental impact of your digital usage, specifically related to Zoom?
34	34	34	34	34	34	34	34	34	34	34
1	1	1	1	1	1	1	1	1	1	1
1.56	1.88	1.94	1.74	1.50	1.56	1.97	1.94	1.68	1.62	2.26
1.50	2.00	2.00	2.00	1.00	1.50	2.00	2.00	2.00	1.50	2.00
.613	.729	.600	.567	.615	.613	.717	.649	.589	.697	1.024

Figure 4 : SPSS software analyzing of Questions part 2

3.6.5. Data Storage

As the author studying the effects of digital transformation on the environment in Sri Lanka using the Zoom platform, Author put in place a structured data storage strategy that combines a number of techniques to guarantee effective and safe management. Collaborative efforts among research team members were greatly enhanced by the use of cloud-based solutions such as Google Drive, which allowed for easy data sharing and accessible from different places.

Furthermore, by using local server storage, data integrity could be ensured by higher security measures that met with academic information management guidelines. Strict encryption mechanisms were implemented on all storage platforms to protect sensitive data. Regular backups were put in place for local infrastructure and cloud servers as a means of safeguarding against data loss. Moreover, participant confidentiality was protected by strict compliance to data protection laws including the General Data Protection Regulation This comprehensive approach, which combined local servers, cloud-based solutions, encryption methods, and attention to data standards, allowed for the safe storage of research data while maintaining its privacy and credibility over the course of the investigation.

3.7. Target population and sampling

Sampling methodologies and target population definition are critical in study on the environmental impact of digital transformation associated to Zoom usage in Sri Lanka. The persons or organizations in Sri Lanka that actively use Zoom for digital communication and collaboration are considered part of the target population. This could include people in the business world, government agencies, educational institutions, and professionals who use Zoom significantly in their efforts to undergo digital transformation.

A smaller portion of this group that reflects a range of viewpoints and behaviors on Zoom use and environmental consciousness is chosen as part of the sampling process. Maybe the first target should be to get in touch with fifty people. However, the actual sample size obtained may only consist of 37 people or entities due to potential limitations such as accessibility, time constraints, or desire to participate.

Although the target sample size was not met, the 37 participants' replies offer insightful information about Zoom usage habits, environmental consciousness, and opinions regarding the ecological effects of the digital revolution. Although the statistical power and generalizability of the results may be affected by the decreased sample size, significant qualitative and quantitative data can still be obtained for analysis.

In order to improve the validity and reliability of the research, it is important to make sure that the sample obtained is representative of all demographic groups or sectors in Sri Lanka. Furthermore, for openness and correct result interpretation, it is imperative to recognize and address the limitations resulting from the lower sample size in the research findings.

3.8. **The selection of participants**

To ensure a thorough viewpoint in the participant selection process for study on the environmental impact of digital transformation in Sri Lanka through Zoom, a varied pool of persons from different roles and demographics within the community is necessary. The selection criteria include people who actively use Zoom for digital communication and come from a variety of backgrounds, including education, work, and other disciplines.

The group of participants may consist of:

School Students: These individuals, who range in age from 15 to 17, comprise the younger group and using Zoom for both extracurricular and educational purposes.

Undergraduates: Students enrolled in higher education programs who use Zoom for research, remote learning, and teamwork. They are usually between the ages of 18 and 25.

Workers: Between the ages of 26 and 55, professionals from a variety of industries use Zoom for conferences, meetings, and remote work.

In addition to these groupings, there may be inclusion categories titled "Other," which include people from other backgrounds—freelancers, business owners, retirees, etc.—who use Zoom for different reasons.These age ranges are only suggestions and may be changed in accordance with particular research needs and the distribution of study participants. In order to obtain a variety of perspectives on Zoom usage habits and environmental consciousness among Sri Lanka's many demographic groupings, it is intended to guarantee representation across age groups, educational levels, and professional sectors.

3.9. **Reliability, Validity, and Generalizability**

Maintaining the integrity and credibility of the study conclusions requires ensuring the validity, generalizability, and reliability of research findings in the Zoom study on the environmental impact of digital transformation in Sri Lanka.

- Reliability

Accuracy and reproducibility in the study technique and data gathering procedures are essential for establishing reliability. The reliability of the results will be increased by using standardized survey tools, making sure that participants collect data using the same procedures, and using statistical tests for internal consistency. Because of this consistency, other researchers can replicate the study and get comparable results under comparable circumstances.

- Validity

The authenticity and correctness of the results in relation to the planned study objectives are referred to as validity. By making sure that the study's measurements, such as survey questions or interview techniques, accurately represent the constructs under investigation—such as perceptions of the influence of the environment, Zoom usage patterns, and ecological consequences awareness—content validity is maintained. In order to determine if a study accurately measures the target constructs, construct validity entails the use of existing scales or measures that have been validated in prior research. Simultaneously, criteria validity guarantees that study findings correspond to predetermined standards or outside reference points.

- Generalizability

The degree to which research findings may be extrapolated from the study's sample to a larger population is known as generalizability. Although the study may offer insightful information about Zoom's environmental effects in Sri Lanka, extra caution should be used when extrapolating these results to other situations or demographics. A representative and varied sample drawn from many industries and demographic groups increases the likelihood of wider applicability. When applying the results to broader contexts, it is crucial to recognize the limitations of the study and context-specific considerations.

In order to produce reliable and credible findings that meaningfully contribute to understanding the environmental implications of digital transformation via Zoom in Sri Lanka, the research carefully addresses validity through precise measurement tools, reliability through consistent methodology, and generalizability limitations.

3.10. Ethical issues of the research study

Privacy and Informed Commitment: In order to conduct ethical research, participants must provide informed consent, attesting to their understanding of and agreement to participate in the study. Comprehensive research papers stress how important it is to respect participants' autonomy by being transparent about the goals and methods of the study. Maintaining confidentiality is essential for preserving participant identities and sensitive data, in accordance with ethical standards that prioritize privacy protection and data confidentiality.

- Data Security and Protection

A wealth of research materials highlights the moral necessity of data security. Precautionary steps including encryption, access control, and secure storage are essential for protecting private research data. Research papers place a strong emphasis on the necessity of safeguarding data from breaches or unauthorized access in order to preserve the reliability and integrity of the research process.

- Reducing Any Damage and Upholding Trustworthiness

Reducing potential harm to participants is a crucial aspect of ethical considerations. Research studies emphasize how crucial it is to have a respectful and compassionate demeanor when participating in order to prevent discomfort or distress. Maintaining integrity, honesty, and openness throughout the research process is essential to ensuring that findings are accurately represented without discrimination or manipulation.

- Ethical Review and Responsible Communication

Before starting a study, ethical research techniques require obtaining approval from ethical review boards or committees. The process of ethical evaluation guarantees adherence to moral principles and safeguards the rights of all involved. Honesty and accuracy should be the guiding principles for the responsible dissemination of research findings, ensuring that the results are disseminated in an ethical and transparent manner without being misrepresented.

The ethical foundation required to conduct research on the environmental impact of Zoom's digital transformation in Sri Lanka is formed by these ethical issues, which are backed up by thorough research papers and ethical norms. Respecting these moral guidelines is essential to guaranteeing the study's validity, reliability, and credibility.

CHAPTER 4 - PRESENTATION OF RESULTS

4.1. **Demographic Analysis**

4.1.1 **Profession**

What's your profession?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A School student	2	5.7	5.9	5.9
	An Undergraduate	22	62.9	64.7	70.6
	An Employee	8	22.9	23.5	94.1
	House wife	1	2.9	2.9	97.1
	Business men	1	2.9	2.9	100.0
	Total	34	97.1	100.0	
Missing	System	1	2.9		
Total		35	100.0		

Figure 5 : (Demographic Data – Developed by Author)

The study sample shows a wide range of representation as evidenced by the respondents' distribution across different professions. With 22 respondents (62.9%) who identified as undergraduates and 8 respondents (22.9%) who identified as employees, undergraduates made up the majority of participants. A housewife, a company owner, and a school student made up lesser portions of the sample, accounting for 2.9%, 2.9%, and 5.7% of the total. The study's richness is increased by this diversified professional representation, which incorporates perspectives from people with various backgrounds in the workforce. It enables a multidimensional analysis that takes into account many points of view and possible ramifications of the research findings in various professional fields.

4.1.2.**Age**

What's your Age ?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15 to 17	1	2.9	2.9	2.9
	18 to 25	26	74.3	76.5	79.4
	26 to 35	2	5.7	5.9	85.3
	36 to 45	2	5.7	5.9	91.2
	45 to 55	3	8.6	8.8	100.0
	Total	34	97.1	100.0	
Missing	System	1	2.9		
Total		35	100.0		

Figure 6 : (Demographic Data – Developed by Author)

The age distribution of the respondents shows that those between the ages of 18 and 25 make up the largest share of the sample, with 26 respondents (74.3%). Subsequently, the age group of 45 to 55 years old constituted the least significant but still noteworthy fraction of the sample, consisting of 3 respondents and 8.6% of the total. On the other hand, those who answered in the 15–17, 26–35, and 36–45 age groups made up lesser percentages of the sample as well, ranging from 2.9% to 5.7%. A more thorough grasp of how various age groups view and interact with the subject matter is made possible by the respondent pool's age diversity, which also helps to provide a more nuanced analysis of the research findings.

4.1.3 **Gender**

What's your Gender ?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	17	48.6	50.0	50.0
	Male	17	48.6	50.0	100.0
	Total	34	97.1	100.0	
Missing	System	1	2.9		
Total		35	100.0		

Figure 7 : (Demographic Data – Developed by Author)

There was an equal representation of male and female participants in the study, indicating a highly balanced gender distribution of respondents. Of the 34 responders in the sample as a whole, 17 (48.6%) identified as female, and the remaining 17 (48.6%) as male. In order to ensure a more thorough grasp of the research field, a balanced gender distribution within the study sample is crucial since it allows for a varied variety of opinions and experiences. Furthermore, by lowering the possibility of gender-related biases in the analysis and interpretation of the results, this balance enhances the study's trustworthiness.

4.2. **Correlation Analysis**

4.2.1 R02 : Correlation between Frequency of Zoom Usage and Environmental Awareness

Correlations

		1.How frequently do you use Zoom for communication and collaboration purposes?	3.Are you aware of the environmental impact associated with Zoom's operations?
1.How frequently do you use Zoom for communication and collaboration purposes?	Pearson Correlation	1	.324
	Sig. (2-tailed)		.061
	N	34	34
3.Are you aware of the environmental impact associated with Zoom's operations?	Pearson Correlation	.324	1
	Sig. (2-tailed)	.061	
	N	34	34

Figure 8 : Correlation between Frequency of Zoom Usage and Environmental Awareness

"Awareness of Environmental Impact" and "Frequency of Using Zoom" have a 0.324 connection value. A moderately good association between these variables is suggested by this positive number. This association may not be statistically significant at the 0.05 level, though, as indicated by the p-value for this correlation coefficient, which is 0.061 (higher than the typical significance level of 0.05).

In practical terms, people who use Zoom more often for collaboration and communication tend to be more conscious of the environmental impact of Zoom's operations; however, based on the sample data provided (N=34), this relationship may not be statistically significant. The somewhat positive association suggests that there is a tendency for knowledge of Zoom's environmental impact to rise with usage frequency, while this link may not hold true generally and could simply be the result of random variation in this group.

It's important to proceed with care when evaluating these results because statistical significance is dependent on a number of variables, including sample size and the study's specific situations.

In this instance, a bigger sample size may allow the link to attain statistical significance; yet, given the available data, it is barely noteworthy over the usual significance level.

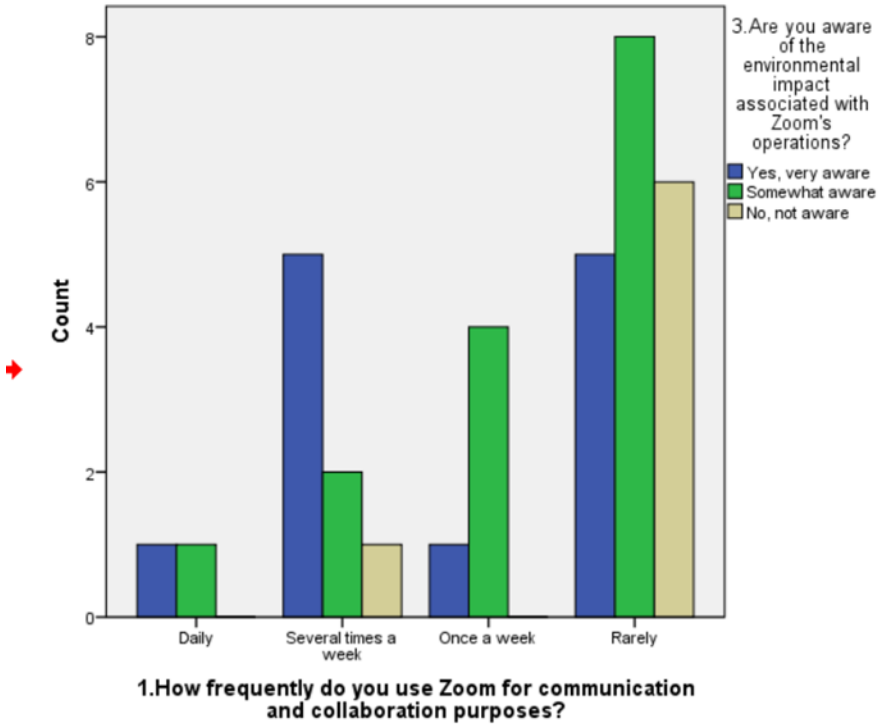


Figure 9 : Bar graph of R02

In this bar graph it shows the correlation between frequency of zoom usage and Environmental Awareness. So in horizontal it shows the the frequently people use zoom for communication and collaboration purpose. In vertical it shows the people that how much aware of the environmental impact associated with zoom operations. In this bar graph the blue bar shows the very aware people about environmental impact , In green color bar show that somewhat aware about this and in yellow color it shows about not aware about this. As above chart people that daily use zoom for communication are less count and also the people that daily use are some are very aware of environmental impact and some of are mid range aware of that the both are equal like count of 1%. And some are use zoom for communication purposes in several times a week about this people there are 5% of very aware people about environmental impact and some are aware about and that is 2% and some are not aware about it that are 15 people. In other hand some people are using once a week so in that category people 4% count of people are aware about it and in that category a few people are very aware of environmental impact. Lastly show in the bar graph about people that rarely communication with zoom that is very high percent. In that count of 5% of people are about environmental impact , count of 8%

people are somewhat aware about it and 6% of people are not aware about it.Overall it can see that Highest percentage of people are rarely use the zoom to communication purposes and highest percentage of people somewhat aware about environmental impact in the bar graph.

4.2.2. RO3: Correlation between Energy Consumption Consideration and Environmental Awareness

Correlations

Correlations

		4.Have you considered the energy consumption implications while using Zoom?	3.Are you aware of the environmental impact associated with Zoom's operations?
4.Have you considered the energy consumption implications while using Zoom?	Pearson Correlation	1	.364*
	Sig. (2-tailed)		.035
	N	34	34
3.Are you aware of the environmental impact associated with Zoom's operations?	Pearson Correlation	.364*	1
	Sig. (2-tailed)	.035	
	N	34	34

*. Correlation is significant at the 0.05 level (2-tailed).

Figure 10 : Correlation between Energy Consumption Consideration and Environmental Awareness

The information shows a statistically significant positive connection (0.364) between users' awareness of Zoom's environmental impact and their assessment of the implications of their energy use when using the platform. Within this sample, both variables exhibit a propensity to move in tandem in a favorable manner. This implies that those who actively think about Zoom's energy costs are more likely to be conscious of the company's environmental effects as well. With this sample size (N=34), the statistical significance of the association is indicated by the significance level at p=0.035. This study indicates a more ecologically conscientious approach among those who think about energy usage when using Zoom, and it may also point to a relationship between users' conscious consideration of energy use and their general understanding of Zoom's environmental impact.

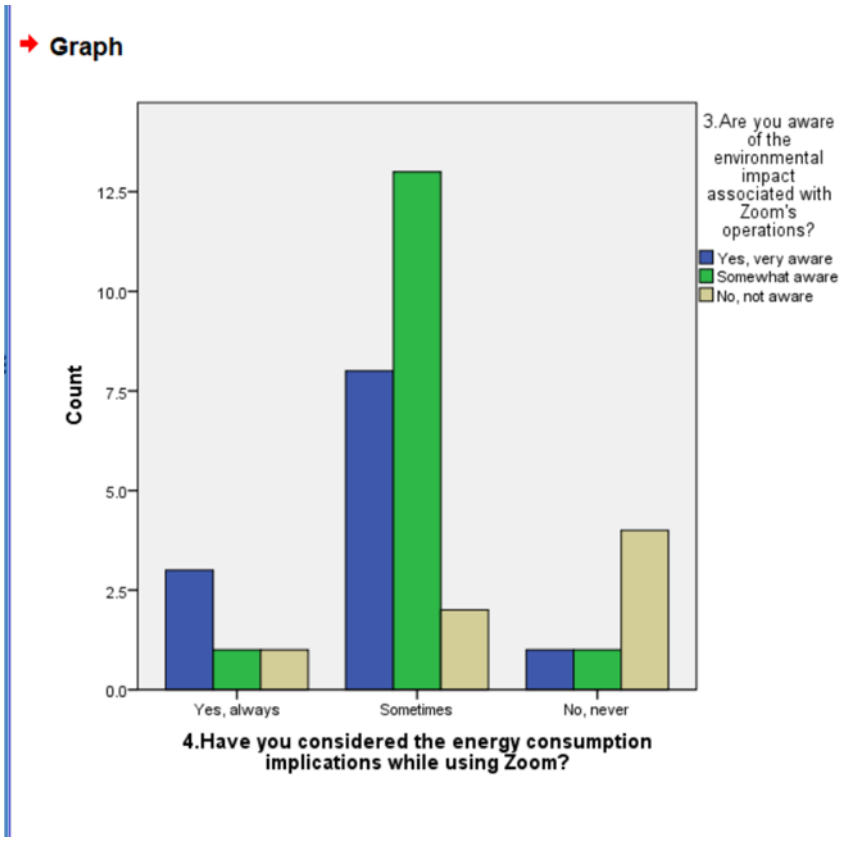


Figure 11: Bar graph of R02

The above bar graph shows the Correlation between Energy Consumption Considerations and Environmental Awareness. In horizontal it shows the considerations of the energy consumption implications while using Zoom and in vertical it shows the Awareness of the environmental impact associated with Zoom's operations. So In the bar graph in blue bar shows the very aware people about the environmental impact of Zoom operations and in green bar shows the moderate level of aware and in the yellow bar shows not aware of this. In the above graph few people considered about the energy consumption implication while using Zoom. In this category people 3% count of people very aware about environmental impact associated with zoom operations and 1% of people somewhat aware and not aware people are equal. Some people are sometimes considered about the energy consumption implication while using zoom In that category people 7.5% of people are very aware of the environmental impact, 13% of people are Some what aware about the environmental impact and 2.0% of people in this category are not aware of the environmental impact. Some people . A very few people are never considered about the energy consumption implications while using zoom. In this category 1% of people are very aware and somewhat aware of the environmental impact and that is equal percentage .There are 4% of people that not aware of the Environmental impact.

4.2.3 RO4: Correlation between Willingness to Adopt Energy-Saving Practices and Environmental Knowledge

Correlations

Correlations

		5.Would you be willing to adopt energy-saving practices while using Zoom?	6.How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?
5.Would you be willing to adopt energy-saving practices while using Zoom?	Pearson Correlation	1	-.026
	Sig. (2-tailed)		.883
	N	34	34
6.How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?	Pearson Correlation	-.026	1
	Sig. (2-tailed)	.883	
	N	34	34

Figure 12 : Correlation between Willingness to Adopt Energy-Saving Practices and Environmental Knowledge

According to the research, there is not a connection between people's awareness of the carbon footprint associated with digital platforms such as Zoom and their inclination to adopt energy-saving techniques when using the platform. With p-values of 0.883 and correlation coefficients of 0.026 and -0.026, respectively, both variables show no statistically significant link in this sample size (N = 34). This shows that participants' understanding of the carbon footprint connected with digital platforms like Zoom does not appear to be related to their readiness to implement energy-saving techniques when using Zoom. These results suggest that although people may indicate a desire to conserve energy, this may not correspond with their comprehension of the carbon footprint linked to digital platforms such as Zoom.

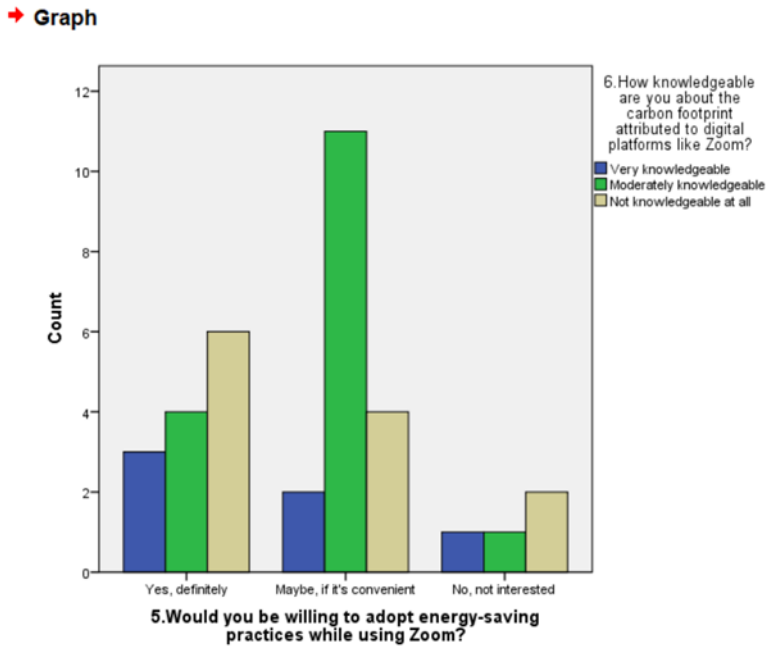


Figure 13 : Bar graph of R03

In this bar graph shows about the Correlation between Willingness to Adopt Energy-Saving Practices and Environmental Knowledge. In horizontal it shows the rate of willing to adopt energy saving practices while using zoom and in vertical shows the rate of the knowledge of the carbon footprint attribute to digital platforms like zoom. So the blue bar shows the high level knowledge about the carbon footprint, the green bar shows the moderate level knowledge about the carbon footprint and in the yellow bar shows the no knowledge peoples rate about the carbon footprint. In the bar graph the categories that are willing to adopt energy are-saving are average level and in this category 3% count of people have a very knowledge about the carbon footprint ,4% count of people are moderately knowledgeable and 6% of people are not knowledgeable about this. In other category says that is convenient to adopt energy savings that rate is pretty much high level So in this category 1% of people are very knowledgeable about carbon footprint, 11% of people are moderately knowledge about it that is the highest level and 4% of people not having knowledge about this. And lastly there are few people not interested about the adopt energy saving practices while using zoom.In this category people 1% of people are very knowledge about carbon footprint and also the moderate knowledge of people rate is same as this and 2% of people are not having knowledge about the carbon footprint.

4.3. **Regression Analysis**

4.3.1 RO1 : Regression Analysis between Profession and Environmental Awareness

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	3.Are you aware of the environmental impact associated with Zoom's operations?[b]	.	Enter

a. Dependent Variable: What's your profession?

b. All requested variables entered.

Figure 14 : Variables Entered/Removed of R01

In order to predict the dependent variable, "What's your age?" the model entered the variable "How frequently do you use Zoom for communication and collaboration purposes" as an independent variable. For this model, the approach used was "Enter," which denotes that the given variable was incorporated into the analysis right away, without going through any sort of selection procedure based on statistical standards such as statistical regression or backward elimination. This implies an effort to determine whether, in the context of the investigation, participants' ages may be predicted or linked to how frequently they use Zoom for communication and cooperation.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.351[a]	.123	.096	.730

a. Predictors: (Constant), 3.Are you aware of the environmental impact associated with Zoom's operations?

Figure 15 : Model Summary of R01

The model summary shows the statistical indicators for the model evaluating the association between participants' ages and how frequently they use Zoom for communication and collaboration.

0.277 is the R value, sometimes referred to as the correlation coefficient. The magnitude and direction of the linear connection between the dependent variable (participants' ages) and the independent variable (frequency of Zoom usage) are represented by this value. There is a weak positive connection between these variables, as indicated by the value of 0.277.

With a R Square value of 0.077, the frequency of using Zoom for communication and collaboration accounts for 7.7% of the variation in participant ages. This implies that the variation in participant ages found can be attributed to factors other than Zoom usage frequency.The R Square value that has been adjusted for the number of predictors in the model is 0.048, which is known as the Adjusted R Square. After taking into consideration the complexity of the model, this modified number shows that the frequency of utilizing Zoom can be directly responsible for 4.8% of the variability in participant ages.The average difference between the ages predicted by the model and the observed ages is represented by the Standard Error of the Estimate (Std. Error of the Estimate). The number in this instance is 0.964, indicating that there is often a 0.964 unit discrepancy between the ages that are anticipated based on Zoom usage frequency and the actual ages that are observed.Overall, the model shows a weak correlation between participants' ages and how frequently they use Zoom for communication and cooperation. Although a relationship exists, the heterogeneity in participants' ages found in this analysis can only be partially explained by the frequency of Zoom usage.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.398	1	2.398	4.502	.042[b]
	Residual	17.043	32	.533		
	Total	19.441	33			

a. Dependent Variable: What's your profession?

b. Predictors: (Constant), 3.Are you aware of the environmental impact associated with Zoom's operations?

Figure 16 : Anova of R01

The ANOVA results present the statistical analysis of a regression model investigating the relationship between participants' ages and how frequently they use Zoom for communication and cooperation. The results of the model's regression analysis show that the range in

participant ages observed in this sample cannot be adequately explained or predicted by the frequency of Zoom usage alone.

Regression model F-test results show an F-value of 2.664 and a corresponding significance (Sig.) of.112 (11.2%). This implies that the model's depiction of the association between Zoom usage frequency and participant age may not be statistically significant at the traditional alpha threshold of 0.05. Put another way, rather than indicating a real, trustworthy correlation, the observed relationship between these variables in our research could just be the result of chance.The model's failure to achieve statistical significance suggests that, although a relationship between Zoom usage frequency and ages may exist, it may not hold true in this particular sample or may not be significant enough to make accurate age predictions based only on the frequency with which people use Zoom for collaboration and communication.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.652	.340		4.855	.000
	3.Are you aware of the environmental impact associated with Zoom's operations?	.362	.171	.351	2.122	.042

a. Dependent Variable: What's your profession?

Figure 17 : Coneffients of R01

The regression coefficients shed light on the association between participants' ages and how frequently they use Zoom for communication and teamwork. The constant (intercept) value of 1.541 is the predicted age of people when they use Zoom for collaboration and communication infrequently, or zero. The variable "How frequently do you use Zoom for communication and collaboration purposes" has a coefficient of 0.272. According to this coefficient, if all other variables stay the same, there would be an estimated rise in the anticipated age of 0.272 units for every unit increase in Zoom usage frequency. It’s important to remember that the Zoom usage frequency coefficient has a p-value of.112, which is higher than the typical cutoff of.05. This implies that there may not be a statistically significant association in this sample between the frequency of Zoom use and participant age.

Consequently, even though there seems to be a positive correlation between Zoom usage frequency and expected age, this correlation may not be strong enough to be regarded as statistically significant when it comes to estimating or explaining people's ages based only on how frequently they use Zoom for collaboration and communication.

4.3.2 RO2 : Regression Analysis between Age Groups and Zoom Usage Frequency

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	1.How frequently do you use Zoom for communication and collaboration purposes?[b]	.	Enter

a. Dependent Variable: What's your Age ?

b. All requested variables entered.

Figure 18 : Variables entered/removed of R02

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.277[a]	.077	.048	.964

a. Predictors: (Constant), 1.How frequently do you use Zoom for communication and collaboration purposes?

Figure 19 : Model summary of R02

The purpose of the regression model was to investigate the link between participant ages and the frequency of using Zoom for communication and cooperation. One predictor variable—"How frequently do you use Zoom for communication and collaboration purposes?"—was used in the analysis. The R-squared value of the model is 0.077, meaning that the frequency of Zoom use accounts for 7.7% of the variation in participant ages. But according to the

corrected R-squared value of 0.048, only roughly 4.8% of the age variability can be directly linked to Zoom usage frequency when model complexity is taken into account.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.477	1	2.477	2.664	.112[b]
	Residual	29.758	32	.930		
	Total	32.235	33			

a. Dependent Variable: What's your Age ?

b. Predictors: (Constant), 1.How frequently do you use Zoom for communication and collaboration purposes?

Figure 20 : Anova of R02

The regression model's statistical significance is displayed in the ANOVA table. The F-value of 2.664 indicates that, although a link between the frequency of Zoom usage and age may exist, it may not be statistically significant in this population. Given that the related significance level (Sig.) is higher than the usual cutoff point of 0.112, or 11.2%—it is possible that the model does not provide enough evidence to substantiate the claim that Zoom usage frequency is a reliable indicator of participant age.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.541	.559		2.758	.010
	1.How frequently do you use Zoom for communication and collaboration purposes?	.272	.166	.277	1.632	.112

a. Dependent Variable: What's your Age ?

Figure 21: Coefficients of R02

By analyzing the coefficients, the expected age at zero Zoom usage frequency is shown by the constant (intercept), which is 1.541. The coefficient for Zoom usage frequency is 0.272, meaning that the expected age will rise by an estimated 0.272 units for every unit increase in Zoom usage frequency. With a p-value of 0.112, this association does not, however, seem to be statistically significant.

In conclusion, the statistical significance tests show that although the study points to a positive correlation between Zoom usage frequency and anticipated ages, this association may not be significant or consistent for this particular group. According to the analysis's findings, participants' ages may not be significantly predicted or explained by how frequently they use Zoom for communication and cooperation.

4.3.3 RO3 : Regression Analysis between Gender and Energy Consumption Consideration

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	4.Have you considered the energy consumption implications while using Zoom?[b]	.	Enter

a. Dependent Variable: What's your Gender ?

b. All requested variables entered.

Figure 22 : Valubles Entered/Removed of R03

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.052[a]	.003	-.028	.515

a. Predictors: (Constant), 4.Have you considered the energy consumption implications while using Zoom?

Figure 23 : Model summaryof R03

How successfully the predictor variable, "Have you considered the energy consumption implications while using Zoom," predicts the variation in participants' genders is summarized in the model summary. The R-squared value of 0.003 suggests that this predictor can only explain around 0.3% of the variance in gender. Taking into account the complexity of the

model, the adjusted R-squared value of -0.028 indicates that the variable is not a significant factor in explaining gender differences in this particular context.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.023	1	.023	.086	.771[b]
	Residual	8.477	32	.265		
	Total	8.500	33			

a. Dependent Variable: What's your Gender ?

b. Predictors: (Constant), 4.Have you considered the energy consumption implications while using Zoom?

Figure 24 : Anova of R03

The regression model's statistical significance is assessed using the ANOVA table. Based on taking into account the consequences of energy usage when using Zoom, the regression model is not statistically significant in predicting gender, as indicated by the F-value of 0.086 and the associated significance level (Sig.) of 0.771 (or 77.1%). These results imply that gender differences within this particular sample may not be significantly explained or predicted by this predictor variable.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.408	.327		4.298	.000
	4.Have you considered the energy consumption implications while using Zoom?	.046	.155	.052	.293	.771

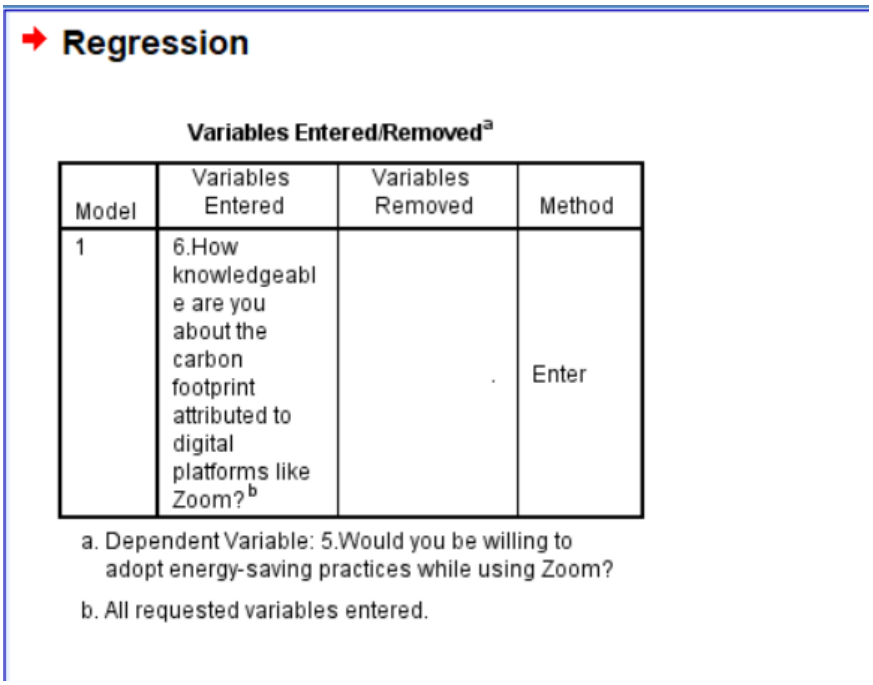
a. Dependent Variable: What's your Gender ?

Figure 25: Coeffients of R03

Looking at the coefficients, the gendered imagined result when the predictor variable is zero is represented by the constant (intercept) value of 1.408. "Have you considered the energy consumption implications while using Zoom?" has a coefficient of 0.046. The corresponding p-value of 0.293, however, indicates that there may not be any statistical significance in this link. Consequently, even while a little positive correlation seems to exist, it may not be a reliable indicator of gender prediction or explanation based on the data under consideration.

In conclusion, this research suggests that neither the genders of the participants in this particular sample nor the consequences of energy usage while using Zoom seem to be meaningfully predicted or explained. The model suggests that in this particular setting, gender disparities among participants are not significantly influenced by this variable.

4.3.4 RO4: : Regression Analysis between Willingness to Adopt Energy-Saving Practices and Environmental Knowledge



Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	6.How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?[b]	.	Enter

a. Dependent Variable: 5.Would you be willing to adopt energy-saving practices while using Zoom?

b. All requested variables entered.

Figure 26 : Variables Entered /Removed of R04

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.026[a]	.001	-.031	.676

a. Predictors: (Constant), 6.How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?

Figure 27 : Model summary of R04

According to the model summary, the variable "How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?" has the ability to predictably explain variances in people's desire to use Zoom energy-saving techniques. The R-squared value of 0.001 indicates that this predictor accounts for an unimportant 0.1% of the variability in the desire to undertake energy-saving techniques. Furthermore, the variable does not significantly

contribute to explaining this behavior after taking model complexity into account, as seen by the modified R-squared value of -0.031.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.010	1	.010	.022	.883[b]
	Residual	14.608	32	.456		
	Total	14.618	33			

a. Dependent Variable: 5.Would you be willing to adopt energy-saving practices while using Zoom?

b. Predictors: (Constant), 6.How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?

Figure 28 : Anova of R04

The regression model's statistical significance is evaluated using the ANOVA test. The regression model is not statistically significant in predicting people's willingness to adopt energy-saving practices based on their knowledge about the carbon footprint attributed to digital platforms like Zoom, as indicated by the F-value of 0.022 and the associated significance level (Sig.) of 0.883 (or 88.3%). These findings imply that, for the particular sample under consideration, this predictor variable may not have a significant impact on the prediction or explanation of desire to adopt energy-saving behaviors.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.788	.376		4.761	.000
	6.How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?	-.024	.164	-.026	-.148	.883

a. Dependent Variable: 5.Would you be willing to adopt energy-saving practices while using Zoom?

Figure 29 : Coeffients of R04

When the predictor variable is zero, the expected result for willingness to adopt energy-saving activities is 1.788, according to the analysis of the coefficients. "How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?" has a coefficient of 0.024.

The corresponding p-value of 0.883, however, indicates that there may not be statistical significance in this association. Consequently, the model refutes the claim that people's propensity to adopt energy-saving behaviors can be accurately anticipated or explained by their awareness of the carbon footprint of websites such as Zoom.

To summarise, the study suggests that people's readiness to adopt energy-saving practises when utilizing digital platforms like Zoom is not significantly predicted or explained by their understanding of the carbon footprint, at least not for this particular group. According to the model, this variable is not very important in influencing people's decisions on energy-saving behaviors in this situation.

CHAPTER 5 - CONCLUSIONS AND RECOMMENDATIONS

5.3 Conclusion

4.2.1 RO1

Conclusion of Regression: Profession and Environmental Awareness

Regression analysis for RO1 shows interesting results on the association between respondent's profession and awareness of Zoom's environmental impact. According to the model, Zoom's environmental effect accounts for a considerable amount of explanatory power ($R2 = 0.123$), or 12.3% of the variance in the respondents' occupation. This implies that there may be a relationship between a person's occupation and their awareness of Zoom's operations' environmental effects.

A positive correlation is indicated by the statistically significant beta coefficient ($\beta = 0.351$, $p = 0.042$) for the predictor variable, which is the awareness of Zoom's environmental impact. This shows that there's a tendency for certain professions to be more prevalent among those who become more aware of the environmental impact linked with Zoom. This relationship may suggest that particular occupations or professional backgrounds require or promote a greater degree of knowledge of environmental issues, which could result in a greater understanding of the environmental effects of digital platforms such as Zoom.

It's important to interpret these findings carefully, though. The analysis does not prove causation, even though it demonstrates a statistically significant association between awareness and profession. It's probable that some occupations stress or expose people to environmental difficulties more than others, which makes people more conscious of Zoom's environmental effect. Furthermore, additional factors that were left out of this analysis could help us understand the relationship between awareness and occupation in greater detail.
More studies looking at a larger range of factors or concentrating on certain professions may provide more insight into the complex relationship between a person's career and their knowledge of the environmental effects of digital platforms like Zoom. Such sophisticated knowledge could support customized approaches to raise awareness and encourage environmental conscience in many professional fields.

4.2.2 RO2

Conclusion of Correlation: Between Frequency of Zoom Usage and Environmental Awareness

The results of the correlation analysis for RO2, which looked at the connection between Zoom usage frequency and environmental awareness, are interesting but not entirely conclusive. Although there is a moderate positive correlation between these variables, according to the Pearson correlation coefficient ($r = 0.324$, $p = 0.061$), it is not statistically significant at the traditional alpha level of 0.05. The data indicates a potential positive correlation between Zoom usage frequency and environmental effect awareness, although the strength of this relationship may be limited by the small sample size.

The somewhat positive correlation coefficient implies that Zoom users may exhibit a marginally higher level of knowledge about the environmental effects of the platform. Although the link seems promising, it should be cautious to make definite conclusions from this data alone because it lacks statistical significance ($p = 0.061$). To determine a more conclusive association between these variables, a bigger sample size may be required or there may be additional affecting factors.

It's critical to recognize how outliers or the small sample size may affect the analysis's statistical power. The association between Zoom usage frequency and environmental awareness may be better understood with a bigger and more varied sample. To further enhance the analysis and provide a more thorough explanation of this association, supplementary variables like educational background or professional exposure to environmental concerns might be investigated.

As a result, even though the data points to a possible correlation between Zoom usage frequency and environmental awareness, more research is clearly necessary given the lack of statistical significance. Subsequent research endeavors including greater sample sizes or supplementary factors may bolster the resilience of these conclusions and provide more profound perspectives on the complex correlation between Zoom usage behaviors and ecological awareness.

Conclusion of Regression: Analysis between Age Groups and Zoom Usage Frequency

Though the results are not entirely clear, the regression analysis used to investigate the association between age groups and Zoom usage frequency provides some intriguing insights. According to the model's summary, there is a weakly positive correlation (R = 0.277, R Square = 0.077) between these variables, which accounts for about 7.7% of the variation in Zoom usage frequency between age groups. Nevertheless, the corrected R Square of 0.048 suggests that the included variable may not be sufficient to fully explain the observed variance, suggesting that the predictive capacity of this model appears to be restricted.

The regression model is not statistically significant, according to the ANOVA results (F = 2.664, p = 0.112). This suggests that there may not be a strong enough correlation between age groups and Zoom usage frequency for this analysis to be regarded as accurate or definitive. The p-value (0.112) is higher above the traditional cutoff point of 0.05, so underscoring the lack of statistical significance and raising the possibility that the observed link is the result of chance or other unobserved variables.

Upon examining the coefficients, it is evident that there is a positive correlation between age groups and the unstandardized coefficient (B = 0.272) for the frequency of Zoom usage. The same p-value (0.112), however, does not approach statistical significance, suggesting that the association may not be strong enough to accurately forecast Zoom usage frequency based only on age groups.

In conclusion, the regression analysis does not offer enough data to definitively establish the relationship between age groups and the frequency of Zoom usage, even though there seems to be a slight positive association between them. To get a more complete picture of this relationship, it's important to take into account additional variables or characteristics that might affect how frequently different age groups use Zoom. The reliability and depth of these findings could be improved by conducting future research with a bigger and more diverse sample or by including other pertinent variables.

4.2.3 RO3

Conclusion of Correlation: Between Energy Consumption Consideration and Environmental Awareness

An interesting association may be seen in the correlation analysis between the awareness of Zoom's environmental impact and energy use when using the product. At the 0.05 level of statistical significance, the correlation coefficient of 0.364 indicates a somewhat positive association between these characteristics. This suggests that people are more likely to be aware of Zoom's environmental impact if they consciously examine the energy consequences of using it.

This result suggests that energy-related concerns and environmental awareness are inextricably linked. This association is significant because it indicates that Zoom users who are conscious of their energy use also have a greater understanding of the platform's wider environmental effects. It draws attention to how energy awareness, maybe as a result of heightened sensitivity to resource consumption, may help promote a more comprehensive understanding of environmental implications.

Even though there is a positive association, its moderate intensity suggests that variables other than energy concerns may also have an impact on environmental consciousness. Although it doesn't always suggest causality, the link that was seen shows that these variables are related. Thus, even while Zoom appears to be associated with increased environmental consciousness when it comes to energy consideration, it's important to take into account other aspects that impact environmental consciousness.

The previously mentioned association highlights the significance of promoting energy-efficient behaviors as a means of augmenting wider environmental consciousness. It may be possible to start the process of developing a more thorough awareness of environmental effects by encouraging users of digital platforms like Zoom to think about the energy implications of their use. This would encourage a more environmentally conscientious way of using technology. More investigation into the fundamental causes of this correlation and its ramifications for various user groups may lead to a more sophisticated understanding of environmental consciousness in the digital realm.

Conclusion of Regression: Between Gender and Energy Consumption Consideration

Some fascinating findings come from the regression study looking into the connection between gender and the energy usage factor when using Zoom. The findings show that there is no statistically significant correlation between gender and the propensity to think about the energy consequences of Zoom usage. The coefficient of determination (R Square) for the regression model, which is 0.003, shows that gender differences account for a very small percentage of the variability in the consideration of energy use.

considered the energy consumption consequences while using Zoom coefficient beta value is 0.052, which suggests that there is very little standard effect on gender. This result suggests that people's consideration of energy consumption when using Zoom is not significantly influenced by gender.

These findings imply that people's consideration of energy implications when using Zoom is not substantially influenced by gender. It suggests that when it comes to energy consciousness when utilizing this digital platform, both genders prefer to behave similarly. It's important to remember that even if this study doesn't reveal any clear relationships, there may be more elements that should be looked into that could have an impact on energy consideration.
Although this analysis suggests that gender is not a major predictor of energy consciousness in Zoom usage, it is important to understand that behavioral patterns and environmental awareness may be influenced by a variety of contextual and individual factors in addition to gender. Additional investigation of these variables, either by qualitative or more complete quantitative studies, may provide light on a more thorough comprehension of the complex relationships among demographic variables, technology use, and environmental awareness.

4.2.4 RO4

Conclusion of Correlation: Willingness to Adopt Energy-Saving Practices and Environmental Knowledge

A surprise finding emerges from the correlation study that looks at the relationship between users' understanding of the carbon footprint associated with digital platforms such as Zoom and their desire to adopt energy-saving behaviors while using them. The p-value of 0.883 and the correlation coefficient of -0.026 point to a very weak and statistically insignificant association between these variables. This finding suggests that there is no discernible correlation between respondents' understanding of the carbon footprint of digital platforms like Zoom and their readiness to implement energy-saving activities.

The results suggest that awareness of the carbon footprint of online platforms such as Zoom does not always correspond to a higher propensity to implement energy-efficient behaviors when utilizing the platform. Likewise, there appears to be no correlation between people's propensity to undertake energy-saving behaviors and their awareness or knowledge of Zoom's environmental effects. This surprising lack of association between environmental awareness and the desire to use Zoom energy-efficiently may point to a more intricate web of interrelated variables impacting people's attitudes and actions toward environmental sustainability.

These findings highlight the need for a more thorough investigation of the variables influencing people's choices about energy-saving behaviors. While environmental implications are important to know, there doesn't seem to be much of an impact on behavioral patterns directly, especially when it comes to using digital platforms. Subsequent investigations may explore supplementary factors or psychological facets that could influence people's perspectives and actions regarding embracing energy-efficient techniques when utilizing digital platforms such as Zoom.Comprehending these subtleties is essential to formulating more efficacious approaches or measures intended to encourage ecologically sustainable conduct among digital platform users. This lack of correlation highlights the necessity for a thorough examination into the wide range of factors that influence people's attitudes and behaviors about energy consumption when using technology.

Conclusion of Regression: Between Willingness to Adopt Energy-Saving Practices and Environmental Knowledge

An unexpected result emerged from the regression analysis examining the association between respondents' understanding of the carbon footprint associated with digital platforms such as Zoom and their desire to implement energy-saving techniques while using the platform. A very weak and statistically insignificant association between these variables is revealed by the research. The p-value of 0.883 and the regression coefficient of -0.024 suggest that there is no significant correlation between the degree of knowledge about Zoom's carbon footprint and the readiness to adopt energy-saving activities.

These findings imply that participants' propensity to adopt energy-saving behaviors while utilizing Zoom is not substantially impacted by their awareness with the platform's environmental impact. Likewise, it appears that respondents' knowledge of Zoom's carbon footprint had no bearing on their propensity to adopt energy-saving behaviors. This result begs interesting questions about what really influences people's decisions and habits when it comes to conserving energy when using Zoom.The results suggest that there is a discrepancy between environmental awareness and real behavioral proclivities about energy-saving measures when utilizing digital platforms such as Zoom. It highlights the complexity of the influences and reasons influencing users' decisions to engage in environmentally conscious activity, suggesting that variables other than knowledge may be crucial.

These surprising findings highlight the necessity for more thorough research into the fundamental variables impacting people's attitudes toward energy-saving measures. Comprehending these subtleties may facilitate the development of more impactful interventions or instructional approaches aimed at encouraging eco-friendly practices among Zoom users. The absence of a correlation between environmental awareness and the inclination to embrace energy-efficient measures emphasizes the significance of a comprehensive strategy in encouraging sustainable behaviors when utilizing digital platforms.

4.3 Recommendations

RO1 - Regression Analysis on Environmental Awareness and Profession

Analysis Summary: Zoom has a chance to identify and address certain vocational demands given the noteworthy correlation between environmental awareness and vocations among its users. For example, Zoom can customize features or campaigns that are pertinent to the sustainability priorities of each sector by taking into account the differences in environmental concerns across different professions, such as academics, healthcare, or business.

Targeted Engagement: Developing tactics tailored to a given occupation requires not just raising awareness but also successfully involving users. For example, in association with the relevant professional associations, training webinars or case studies tailored to different professions might showcase industry-related eco-friendly practices or Zoom features that promote sustainability.

business Collaborations: Zoom can create materials or content that is carefully chosen to address the environmental concerns of each business by collaborating with associations or thought leaders in that area. In order to promote a feeling of community and shared environmental responsibility, these collaborations may entail industry-specific forums on the Zoom platform for debates, resource sharing, or case study presentations.

Refinement and Customization of Data: It is imperative to do more thorough data refinement through targeted surveys or user studies within professional demographics. Zoom can collect information about particular preferences or issues regarding environmental awareness across a range of professions, and then customize its features, interface, or instructional materials to better meet these unique requirements.

RO2 - Correlation Between Zoom Usage Frequency and Environmental Awareness

Correlation insight: There may be a chance to smoothly integrate sustainability education into the Zoom experience, as seen by the moderately positive correlation that was found between the frequency of Zoom usage and environmental awareness. Zoom can investigate strategies to actively engage users throughout their frequent Zoom sessions by knowing this association.

Integration Strategies: Users' awareness of the environmental impact of Zoom can be raised without interfering with their workflow by judiciously introducing environmental snippets, such as energy-saving advice or pop-up notifications, during Zoom usage. By integrating these into the UI, you can easily encourage environmentally conscious behavior and guarantee accessibility.

User-Centric Features: The Zoom interface's customizable goal trackers and environmental settings let users match their usage habits with sustainable objectives. Encouraging users to establish personal environmental goals or track their reduction of carbon footprint in sessions increases user accountability and encourages conscientious usage.

Continuous Improvement: By creating an organized feedback loop, users can actively offer opinions and ideas regarding the usefulness and efficacy of integrated features. Iterative changes are made possible by this continuous communication, guaranteeing Zoom's responsiveness to changing customer requirements and sustainability expectations.

RO3 - Energy Consumption Consideration and Environmental Awareness

Interpretation of Correlation: Zoom has a chance to actively promote environmentally conscious behaviors among its customers given the noteworthy positive correlation between energy consumption concern and environmental awareness. Zoom can implement customized tactics to bring consumers' energy-related considerations into line with more general environmental concerns.

Energy-Efficient Features: By including energy-saving options or prompts in the Zoom interface, users can be guided and encouraged to follow greener practices when conducting

sessions. This could include functions like power-saving modes that operate automatically or alerts to adjust settings to use less energy.

User Engagement: It's critical to run awareness efforts to inform consumers about the immediate environmental benefits of using energy-efficient practices when using Zoom. These efforts, which emphasize the value of energy conservation during virtual meetings, can include educational materials, webinars, or in-app notifications.

Encouraging Sustainability: Users could be greatly encouraged to take sustainable behaviors by looking into incentive programs or awards for using less energy during Zoom sessions. Providing rewards for eco-friendly actions, such as virtual prizes, badges, or recognition, can motivate more users to take part in energy-saving projects.

RO4 - Willingness to Adopt Energy-Saving Practices and Environmental Knowledge

Correlation insights: There appears to be a need for more interesting educational content on the Zoom platform, as evidenced by the negligible association between environmental knowledge and the readiness to undertake energy-saving actions.

Enhancement of Instruction: This gap might be filled by improving instruction on energy-saving techniques, directly connecting their impact, and displaying energy-saving indicators in real time within Zoom meetings. Encouraging users to convert knowledge into useful actions can be achieved by making material easily readable and accessible.

Interactive Learning: You may better engage users with Zoom by incorporating interactive features, quizzes, or mini-tutorials that explain the immediate advantages of energy-saving measures. Learning about sustainability can be made more engaging and memorable with the use of gamified learning experiences or interactive modules.

User-Centric Approach: Zoom can collect user input to improve interactive features and instructional content so that users' environmental concerns are addressed and the content is relevant. Content can be tailored to reflect different user tastes and levels of environmental awareness with the use of regular user surveys or feedback methods.

Recommendations for R01, R02, R03, R04

Holistic plan: Developing a holistic plan requires integrating the findings from all analyses. Form cross-functional teams to work together on user engagement methods, instructional content creation, and feature development, making sure that these efforts are in line with recognized environmental concerns.

Iterative Refinement: Establish a feedback loop to iteratively improve user experiences, instructional programs, and features in response to changing environmental issues and user feedback. Iterative processes provide adaptability to shifting customer requirements and environmental concerns.

Community Involvement: Start user-focused initiatives that tackle environmental issues and provide users the tools they need to actively support a sustainable environment. Encourage users to use the Zoom platform to share their tales or sustainability practices in order to create a feeling of community involvement.

Sustainable Integration: Promote an environmentally conscious culture across the Zoom platform. Incorporate sustainable practices and spread environmental awareness on a constant basis to motivate users to make eco-friendly decisions during and after Zoom sessions. To keep users engaged, this can entail regular updates on the platform's sustainability initiatives and continuous environmental education.

4.4 Limitations

Recognizing a study's limitations is just as important as accepting its conclusions. Recognizing specific limitations is crucial when investigating the environmental effects of digital transformation on platforms such as Zoom, as these dictate the limits and interpretations of the research.

The study's dependence on survey answers prompts questions regarding the representation and quality of the data. It is possible that some Zoom users' varied global viewpoints were not fully captured in the data collected, which could have skewed the results toward particular demographics or behaviors. This restriction can make it more difficult for conclusions to be

applied to a larger group of users.Self-reported surveys are naturally subject to subjectivity and response bias, which may compromise the veracity of users' claimed activities and environmental awareness on Zoom. Responses could be influenced by social desirability or personal biases, which would affect the study's accuracy in determining users' true preferences and behaviors.Another issue is time limits, since technology is developing quickly. The results of the study may become old as a result of changing user behaviors and technology improvements. Over time, this restriction can make the study less relevant.It may also be difficult to determine cause from correlations found in the study. Correlations are informative, but they do not indicate causality. It might take more in-depth research or experimental methods to fully comprehend the causal relationship between environmental awareness and user behavior on Zoom.

Finally, it's possible that not all environmental factors pertaining to Zoom were covered in the study. A thorough grasp of the study may be limited by factors that are missed, such as indirect environmental repercussions or subtle user patterns beyond Zoom usage.The knowledge of the environmental impact of digital platforms can be improved by acknowledging and addressing these limitations in further study. It is imperative to consider these limitations when interpreting the study's findings in order to achieve a more accurate and comprehensive understanding of the subject.

4.5 Future Improvements

A number of enhancements should be taken into consideration to better future studies examining the environmental effects of Zoom's digital transformation in Sri Lanka. First, a more thorough knowledge of the impact might be obtained by expanding the study's scope to include a more varied sample from different organizational levels and demographic sectors. Furthermore, combining quantitative data collecting with qualitative techniques like focus groups and in-depth interviews can provide greater insights into how users perceive and behave in relation to Zoom's environmental effects. Enhancing the research's breadth and depth could involve adding ongoing research to track changes over time and extending the investigation to include comparison analyses with other digital platforms or geographical areas.

Moreover, the incorporation of novel technology or inventive techniques for gathering data might augment the precision and significance of the results, guaranteeing that the study stays at the leaders of environmental sustainability investigations concerning digital revolutions.

Lastly, cooperation with legislators or environmental organizations may encourage real-world implementations of study findings, supporting sustainable practices in the digital sphere. These developments may have a major impact on a more thorough and comprehensive investigation of Zoom's environmental effects in Sri Lanka

4.6 Personnel Reflection

As the author Reflecting on the research process exploring Zoom's digital transformations and their effects on the environment in Sri Lanka, it has been an interesting one. Studying this subject was challenging; it's not simple to understand how technology impacts the environment. There were moments when getting all the data required to understand the big picture proved to be difficult. But these difficulties also made it clear what could be better. Author realized the importance it is to include more people and gather a range of ideas in order to truly understand how our digital behaviors affect the environment.

The best part was learning how our digital behaviors affect the environment we live in. It has stoked authors interest about how to use technology more environmentally friendly. This research is interesting even if it was difficult because its main goal is to develop technology that benefits the environment rather than harms it.

4.6.1 Benefits for the researcher

Investigating Zoom's digital presence in Sri Lanka has provided a number of valuable benefits. First of all, it has made it possible to investigate thorough an important point where technology and environmental sustainability meet. Researchers desire to learn more has been motivated by this research, which has encouraged researcher to explore the complexity of digital ecosystems and their environmental effects in greater detail. Researchers research abilities have been much improved by the process of developing techniques and evaluating data. This has allowed researcher to develop a more thorough understanding of environmental factors in the digital landscape as well as a careful ability to evaluate data.

The possibility of an impact on society is still another important advantage. The results of this study may provide a strong foundation for educating people about the environmental effects of digital revolutions. When research backs up arguments for environmentally friendly behaviors in using technology, it becomes more realistic. The present study provides focus on the possible

connections between technology and environmental issues, enabling well-informed discussion and justified decision-making.

Moreover, the research forms the basis for personal as well as professional growth. It has strengthened researchers will to make an important contribution to the growth of sustainable technology and created a sense of responsibility to promote a more environmentally friendly digital future. As a researcher, this project has strengthened researchers academic abilities and fueled researchers desire to lead research projects that combine technology advancements with environmental responsibility.

4.6.2 Benefits for the Industry/organization

For the industry or organization in issue, doing study on the environmental effects of Zoom's digital transformation in Sri Lanka has several advantages. First of all, this research offers a chance for active involvement in sustainability projects. Organizations can present themselves as good for the environment by including global environmental goals into their plans and evaluating and mitigating the ecological footprint of their digital activities. These kinds of projects not only benefit society as a whole but also help the company become more recognizable to investors and customers who value sustainability.

Furthermore, product development and technology innovation can use this research as a guide. The study's findings provide a thorough grasp of how digital transformations affect the environment. This information enables businesses to develop and apply environmentally friendly technology solutions. These findings have the potential to encourage the development of environmentally sensitive products and services, so raising the bar for eco-friendly innovation in the sector, ranging from optimizing energy use to supporting sustainable digital practices.

Moreover, the research findings may serve as an engine for partnerships and collaborations. Disseminating the research's best practices and findings should encourage industry-wide discussions about sustainable technological improvements. Working together, different stakeholders—such as business leaders, legislators, and environmentalists—can propel group efforts in the direction of a more environmentally friendly digital future. In addition to helping the sector as a whole, this cooperation fortifies networks and alliances and makes it easier to exchange resources and knowledge for sustainable development.

Finally, this study advances environmental responsibility awareness and thinking leadership. Businesses that promote sustainability through research projects establish themselves as leaders in the field dedicated to reducing their negative effects on the environment. This campaigning may have an impact on industry standards and regulatory structures, helping to promote policies that give environmental factors first priority in the development of new technologies. In the end, the research is a key component in developing a sustainable culture, which in turn pushes innovations both inside and outside the sector.

Referencing

Abuhamda, E.A.A. and Bsharat, T.R.K., 2021. Understanding quantitative and qualitative research methods: A theoretical perspective for young researchers. Article in International Journal of Research. [online] https://doi.org/10.2501/ijmr-201-5-070.

Feroz, A.K., Zo, H. and Chiravuri, A., 2021. Digital transformation and environmental sustainability: A review and research agenda. Sustainability (Switzerland), 13(3), pp.1–20. https://doi.org/10.3390/su13031530.

Heilig, L., Schwarze, S. and Voß, S., n.d. An Analysis of Digital Transformation in the History and Future of Modern Ports. [online] Available at: <https://www.dakosy.de/en/solutions/>.

Johannesson, P. and Perjons, E., 2014. Research Strategies and Methods. In: An Introduction to Design Science. Springer International Publishing. pp.39–73. https://doi.org/10.1007/978-3319-10632-8_3.

Joia, L.A. and Lorenzo, M., 2021. Zoom in, zoom out: The impact of the covid-19 pandemic in the classroom. Sustainability (Switzerland), 13(5), pp.1–18. https://doi.org/10.3390/su13052531.

Jones, M.D., Hutcheson, S. and Camba, J.D., 2021. Past, present, and future barriers to digital transformation in manufacturing: A review. Journal of Manufacturing Systems, 60, pp.936–948. https://doi.org/10.1016/j.jmsy.2021.03.006.

Patsavellas, J. and Salonitis, K., 2019. The carbon footprint of manufacturing digitalization: Critical literature review and future research agenda. In: Procedia CIRP. Elsevier B.V. pp.1354–1359. https://doi.org/10.1016/j.procir.2019.04.026.

Schallmo, D.R.A. and Williams, C.A., 2018. History of Digital Transformation. pp.3–8. https://doi.org/10.1007/978-3-319-72844-5_2.

Trappes, R., Cohnitz, D., Pâslaru, V., Perkins, T.J. and Teymoori, A., 2020. The online alternative: Sustainability, justice, and conferencing in philosophy. European Journal of Analytic Philosophy, 16(2), pp.145–172. https://doi.org/10.31820/EJAP.16.2.7.

Truong, T.C., 2022. The Impact of Digital Transformation on Environmental Sustainability. Advances in Multimedia, 2022. https://doi.org/10.1155/2022/6324325.

Vats, M.C., Singh, S.K. and Vats, M.C., 2014. E-Waste Characteristic and Its Disposal. [online] International Journal of Ecological Science and Environmental Engineering International Journal of Ecological Science and Environmental Engineering, Available at:

<http://www.aascit.org/journal/ijesee>.

Wickremasinghe, H.T. and Kumuduni, W.Y., 2022. | ijbes.utm.my | eISSN 2289-8948| IJBES. International Journal of Built Environment and Sustainability, 9(3), pp.35–46. https://doi.org/10.11113/ijbes.

Annexures A: Glossary of Terms

- **Digital Transformation**: Digital transformation refers to the process of incorporating digital technology into several facets of an organization, leading to significant adjustments in value delivery, customer relations, and operations.

- **Environmental Impact**: The quantifiable harm that human activity causes to the environment; in this case, it refers to the effects of digital transformation on natural resources and ecological systems.

- **Zoom Platform**: A digital platform for collaboration and communication that provides chat, online meetings, video conferencing, and document sharing.

- **Sustainability**: the capacity to satisfy current demands without compromising the capacity of future generations to satisfy their own; it is frequently associated with social responsibility, environmental preservation, and economic viability.

- **Eco-friendly Practices**: actions that reduce damage to the environment. Examples include cutting back on energy use, making the best use of available resources, and encouraging eco-friendly behavior.

- **Carbon Footprint:** The total amount of greenhouse gases, particularly carbon dioxide, emitted directly or indirectly by human activities, often associated with environmental impact assessment.

- **ICT (Information and Communication Technology) Infrastructure: The** network of hardware, software, and communication facilities required to operate digital technologies.

- **Data Storage**: The process of archiving, storing, and managing digital information, often referring to the physical devices and systems used to retain data.

- **Energy Consumption**: The amount of energy utilized in performing specific activities or operations, significant in evaluating the environmental impact of digital transformations.

- **Sustainable Solutions**: Practices, technologies, or strategies that aim to address environmental challenges while sustaining or improving economic and social well-being.

- **Environmental Conservation**: Efforts and actions aimed at protecting, preserving, and managing natural resources and ecosystems.

- **Carbon Emissions**: The release of carbon compounds, primarily carbon dioxide, into the atmosphere due to human activities, contributing to climate change.

Annexures B: Sample SPSS Charts/ Table

Demographic Analysis on Gender

What's your Gender ?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	17	48.6	50.0	50.0
	Male	17	48.6	50.0	100.0
	Total	34	97.1	100.0	
Missing	System	1	2.9		
Total		35	100.0		

Figure 30 : Spss Tables

Demographic Analysis on Profession

What's your profession?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A School student	2	5.7	5.9	5.9
	An Undergraduate	22	62.9	64.7	70.6
	An Employee	8	22.9	23.5	94.1
	House wife	1	2.9	2.9	97.1
	Business men	1	2.9	2.9	100.0
	Total	34	97.1	100.0	
Missing	System	1	2.9		
Total		35	100.0		

Figure 31 : Spss tables

Demographic Analysis on Age

What's your Age ?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15 to 17	1	2.9	2.9	2.9
	18 to 25	26	74.3	76.5	79.4
	26 to 35	2	5.7	5.9	85.3
	36 to 45	2	5.7	5.9	91.2
	45 to 55	3	8.6	8.8	100.0
	Total	34	97.1	100.0	
Missing	System	1	2.9		
Total		35	100.0		

Figure 32: Spss Tables

Correlation Analysis in SPSS

RO2: Correlation between Frequency of Zoom Usage and Environmental Awareness

Correlations

		1.How frequently do you use Zoom for communication and collaboration purposes?	3.Are you aware of the environmental impact associated with Zoom's operations?
1.How frequently do you use Zoom for communication and collaboration purposes?	Pearson Correlation	1	.324
	Sig. (2-tailed)		.061
	N	34	34
3.Are you aware of the environmental impact associated with Zoom's operations?	Pearson Correlation	.324	1
	Sig. (2-tailed)	.061	
	N	34	34

Figure 33: Spss Tables

RO3: Correlation between Energy Consumption Consideration and Environmental Awareness

Correlations

Correlations

		4.Have you considered the energy consumption implications while using Zoom?	3.Are you aware of the environmental impact associated with Zoom's operations?
4.Have you considered the energy consumption implications while using Zoom?	Pearson Correlation	1	.364*
	Sig. (2-tailed)		.035
	N	34	34
3.Are you aware of the environmental impact associated with Zoom's operations?	Pearson Correlation	.364*	1
	Sig. (2-tailed)	.035	
	N	34	34

*. Correlation is significant at the 0.05 level (2-tailed).

Figure 34 : Spss tables

RO4: Correlation between Willingness to Adopt Energy-Saving Practices and Environmental Knowledge

Correlations

Correlations

		5.Would you be willing to adopt energy-saving practices while using Zoom?	6.How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?
5.Would you be willing to adopt energy-saving practices while using Zoom?	Pearson Correlation	1	-.026
	Sig. (2-tailed)		.883
	N	34	34
6.How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?	Pearson Correlation	-.026	1
	Sig. (2-tailed)	.883	
	N	34	34

Figure 35 : Spss tables

Bar Graph of correlation Analysis in SPSS

RO2: Correlation between Frequency of Zoom Usage and Environmental Awareness

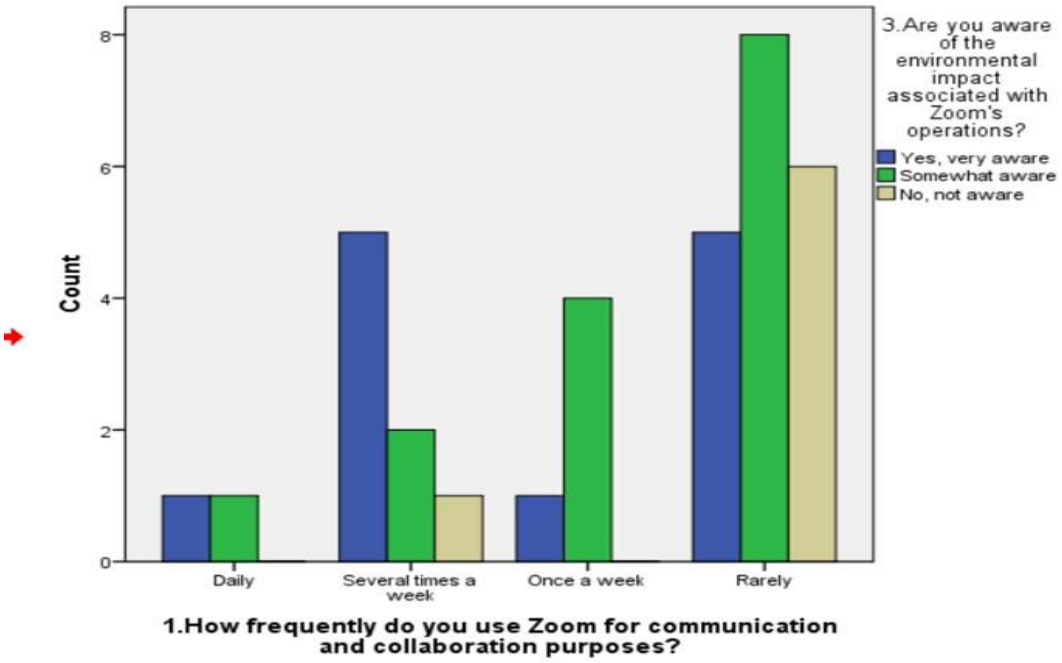


Figure 36: Spss bargraphs

RO3: Correlation between Energy Consumption Consideration and Environmental Awareness

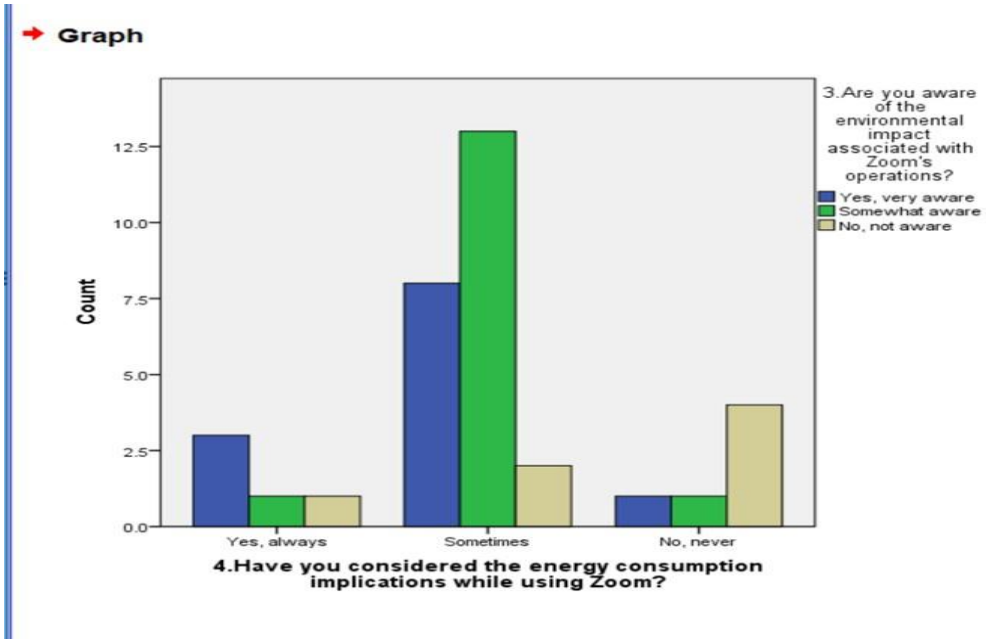


Figure 37: Spss bar graphs

RO4: Correlation between Willingness to Adopt Energy-Saving Practices and Environmental Knowledge

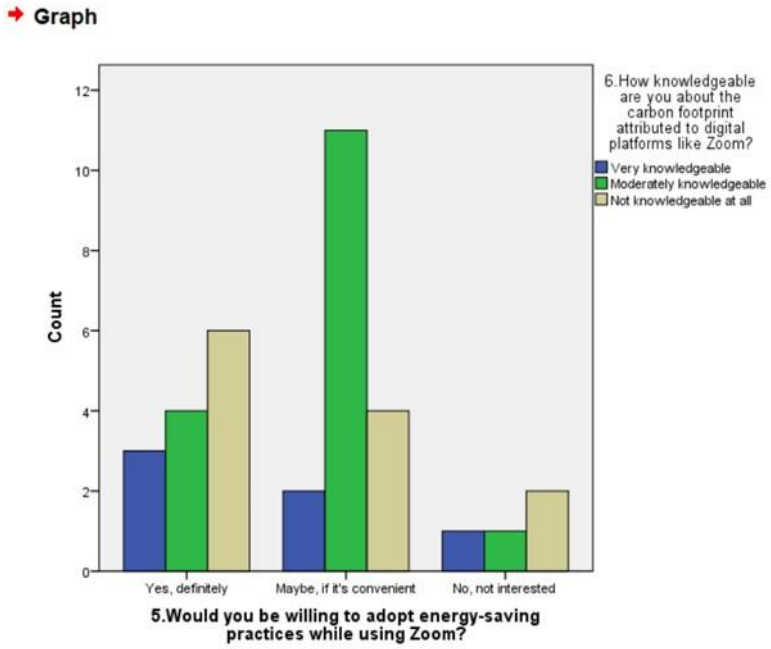


Figure 38: Spss bargraphs

Regression Analysis

RO1: Regression Analysis between Profession and Environmental Awareness (RO1)

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	3.Are you aware of the environmental impact associated with Zoom's operations?[b]	.	Enter

a. Dependent Variable: What's your profession?

b. All requested variables entered.

Figure 39: Spss regression analysis R01

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.351[a]	.123	.096	.730

a. Predictors: (Constant), 3.Are you aware of the environmental impact associated with Zoom's operations?

Figure 40: Spss regression analysis R01

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.398	1	2.398	4.502	.042[b]
	Residual	17.043	32	.533		
	Total	19.441	33			

a. Dependent Variable: What's your profession?

b. Predictors: (Constant), 3.Are you aware of the environmental impact associated with Zoom's operations?

Figure 41: Spss regression analysis R01

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.652	.340		4.855	.000
	3.Are you aware of the environmental impact associated with Zoom's operations?	.362	.171	.351	2.122	.042

a. Dependent Variable: What's your profession?

Figure 42: Spss regression analysis R01

RO2: Regression Analysis between Age Groups and Zoom Usage Frequency (RO2)

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	1.How frequently do you use Zoom for communication and collaboration purposes?[b]	.	Enter

a. Dependent Variable: What's your Age ?

b. All requested variables entered.

Figure 43: Spsss regression analysis R02

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.277[a]	.077	.048	.964

a. Predictors: (Constant), 1.How frequently do you use Zoom for communication and collaboration purposes?

Figure 44: Spsss regression analysis R02

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.477	1	2.477	2.664	.112[b]
	Residual	29.758	32	.930		
	Total	32.235	33			

a. Dependent Variable: What's your Age ?

b. Predictors: (Constant), 1.How frequently do you use Zoom for communication and collaboration purposes?

Figure 45: Spsss regression analysis R02

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.541	.559		2.758	.010
	1.How frequently do you use Zoom for communication and collaboration purposes?	.272	.166	.277	1.632	.112

a. Dependent Variable: What's your Age ?

Figure 46: Spsss regression analysis R02

RO3: Regression Analysis between Gender and Energy Consumption Consideration (RO3)

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	4.Have you considered the energy consumption implications while using Zoom?[b]	.	Enter

a. Dependent Variable: What's your Gender ?

b. All requested variables entered.

Figure 47: Spss regression analysis R03

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.052[a]	.003	-.028	.515

a. Predictors: (Constant), 4.Have you considered the energy consumption implications while using Zoom?

Figure 48: Spss regression analysis R03

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.023	1	.023	.086	.771[b]
	Residual	8.477	32	.265		
	Total	8.500	33			

a. Dependent Variable: What's your Gender ?

b. Predictors: (Constant), 4.Have you considered the energy consumption implications while using Zoom?

Figure 49: Spss regression analysis R03

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.408	.327		4.298	.000
	4.Have you considered the energy consumption implications while using Zoom?	.046	.155	.052	.293	.771

a. Dependent Variable: What's your Gender ?

Figure 50: Spss regression analysis R03

RO4: Regression Analysis between Willingness to Adopt Energy-Saving Practices and Environmental Knowledge (RO4)

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	6.How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?[b]	.	Enter

a. Dependent Variable: 5.Would you be willing to adopt energy-saving practices while using Zoom?

b. All requested variables entered.

Figure 51: Spss regression analysis R04

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.026[a]	.001	-.031	.676

a. Predictors: (Constant), 6.How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?

Figure 52: Spss regression analysis R04

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.010	1	.010	.022	.883[b]
	Residual	14.608	32	.456		
	Total	14.618	33			

a. Dependent Variable: 5.Would you be willing to adopt energy-saving practices while using Zoom?

b. Predictors: (Constant), 6.How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?

Figure 53: Spss regression analysis R04

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.788	.376		4.761	.000
	6.How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom?	-.024	.164	-.026	-.148	.883

a. Dependent Variable: 5.Would you be willing to adopt energy-saving practices while using Zoom?

Figure 54: Spss regression analysis R04

Annexures C: Feedback Form / Question list

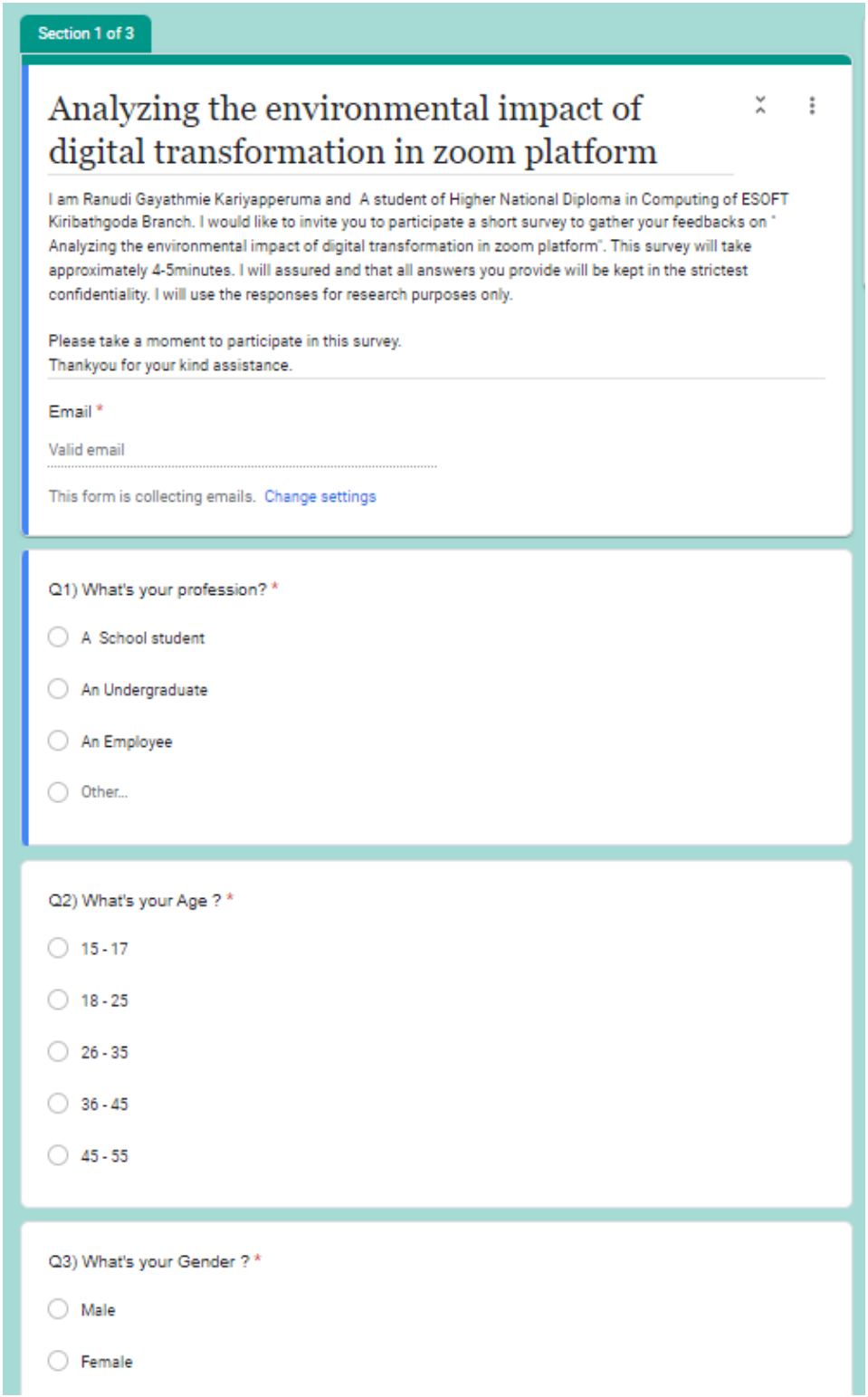


Figure 55 : Question Form 1

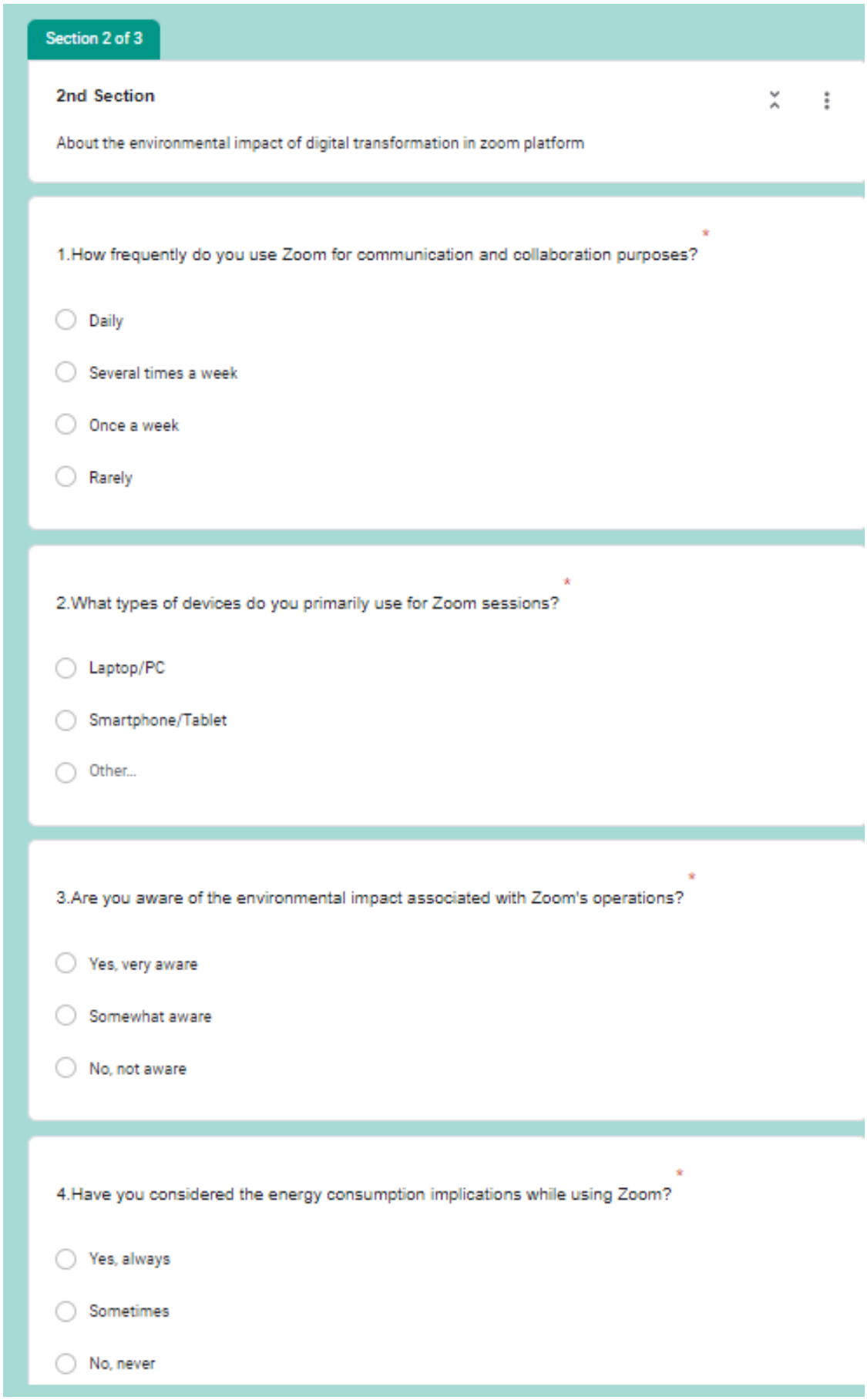


Figure 56 : Question form 2

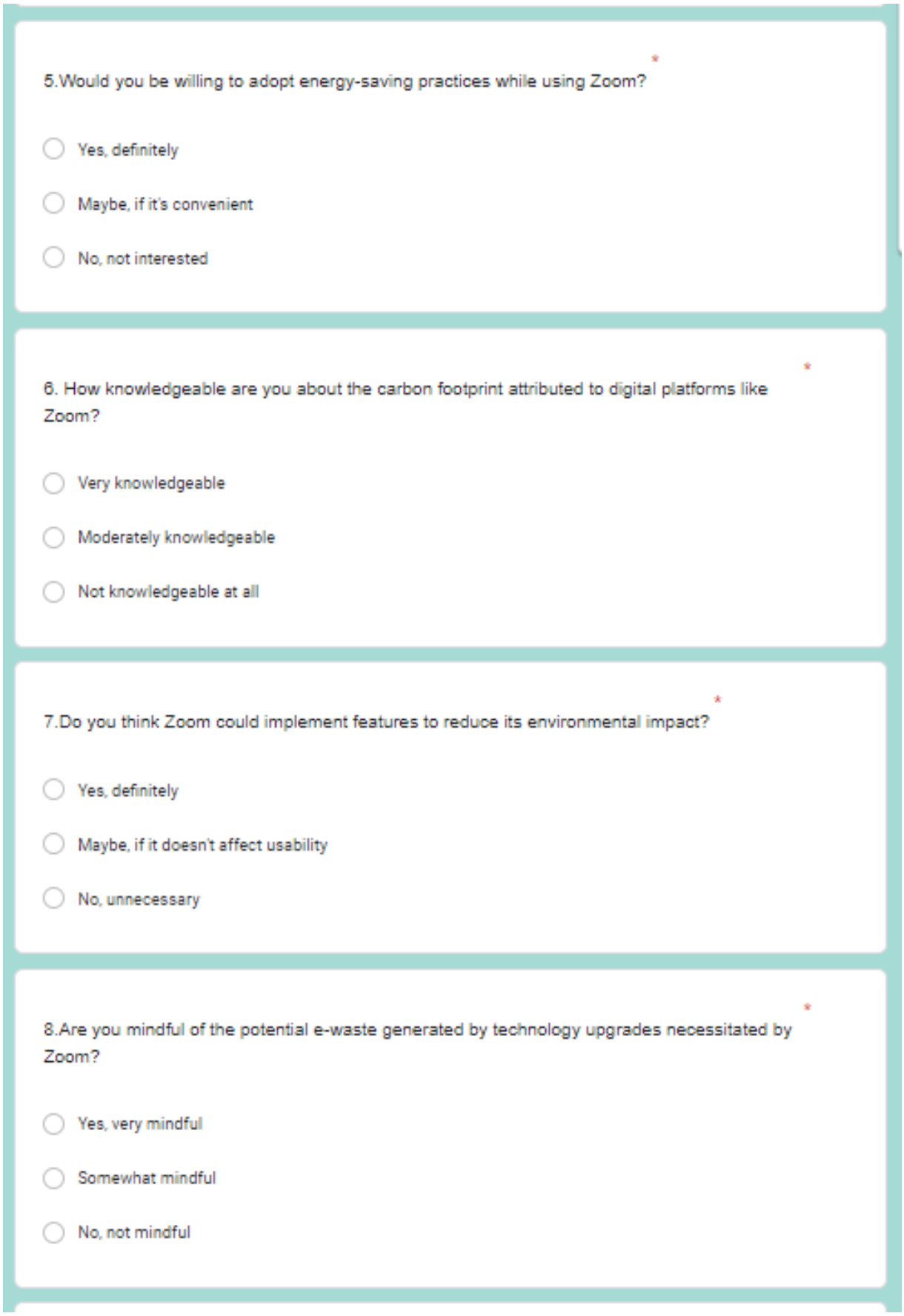


Figure 57 : Question form 3

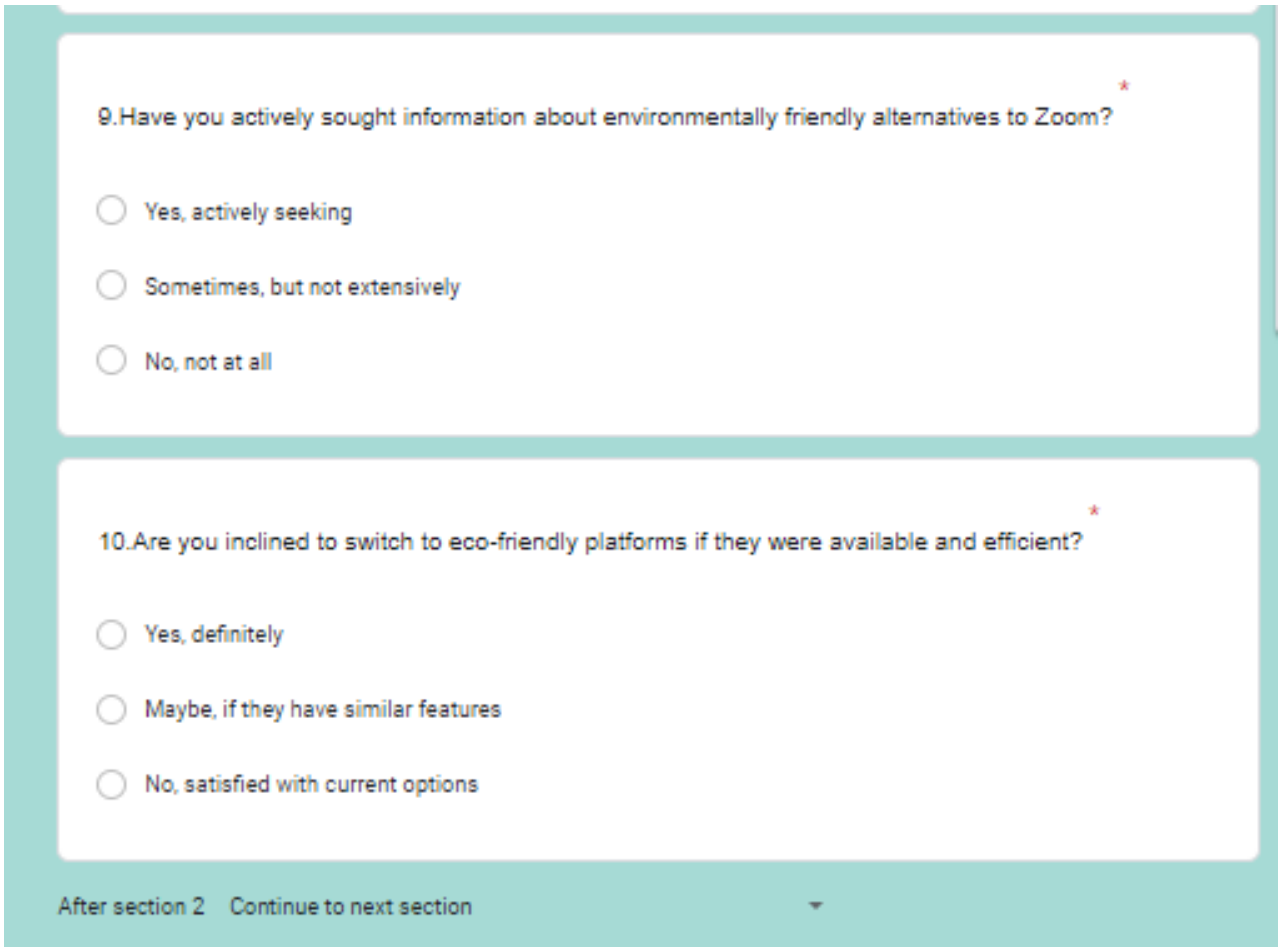


Figure 58 : Question form 4

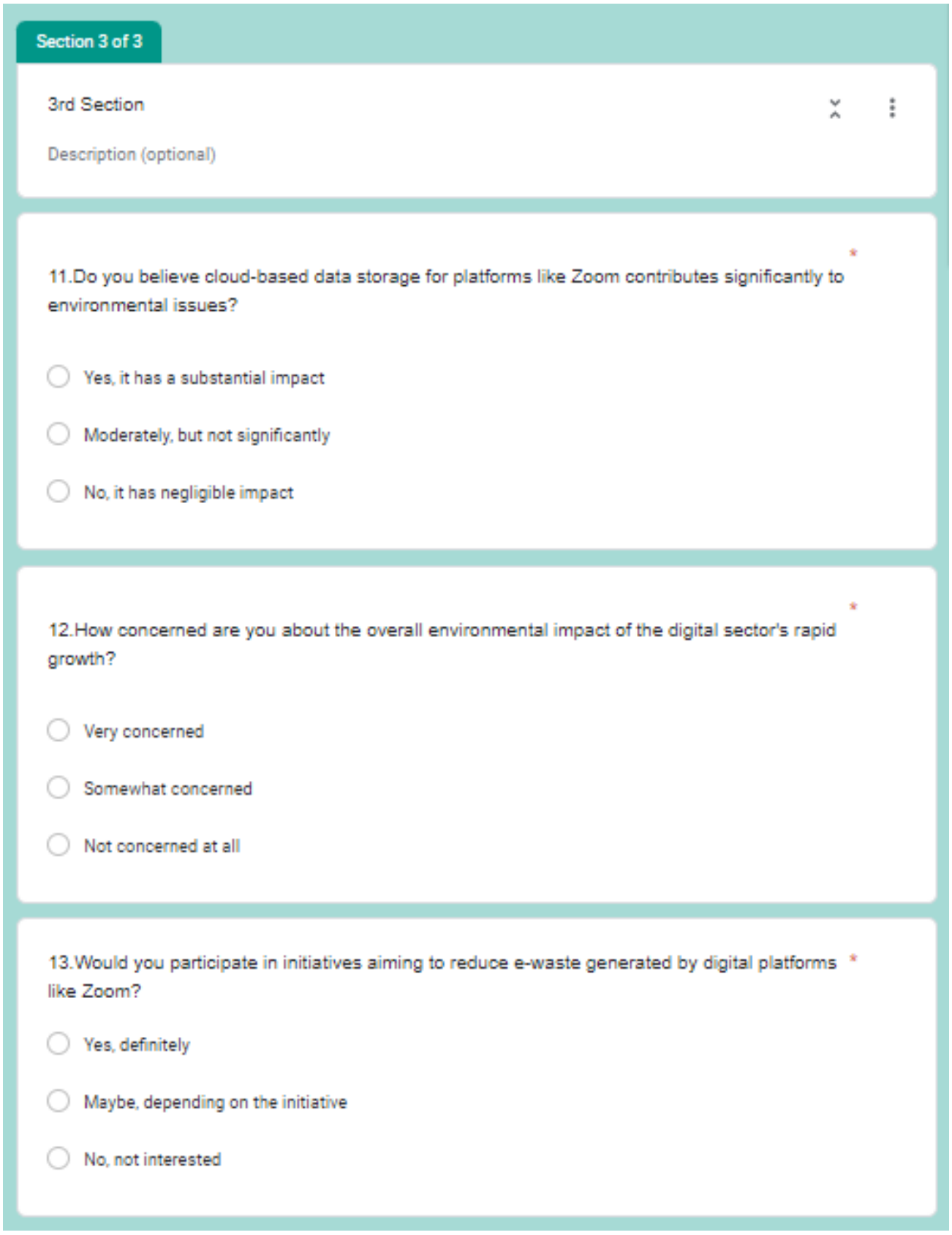


Figure 59 : Question Form 5

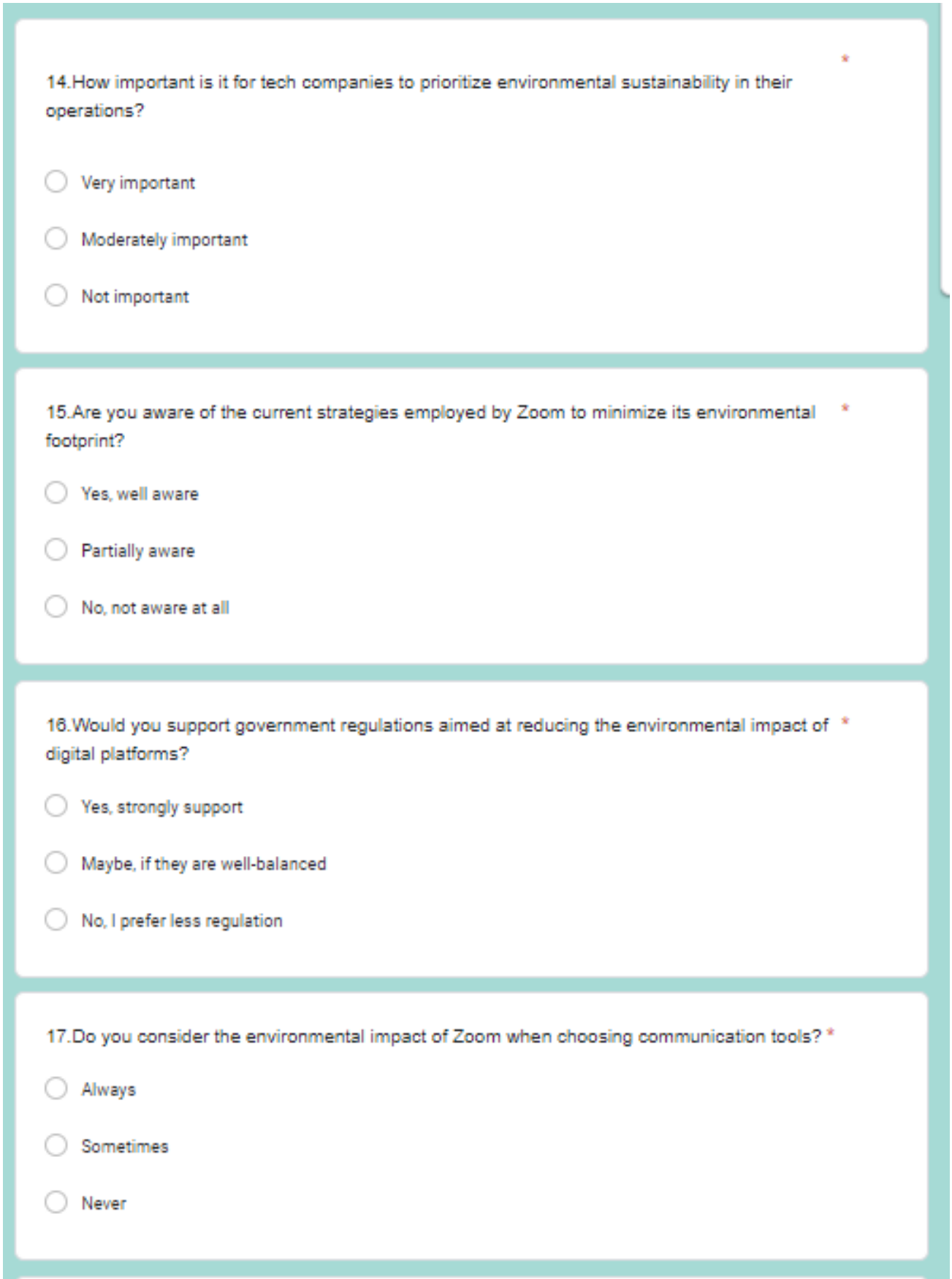


Figure 60 : Question Form 6

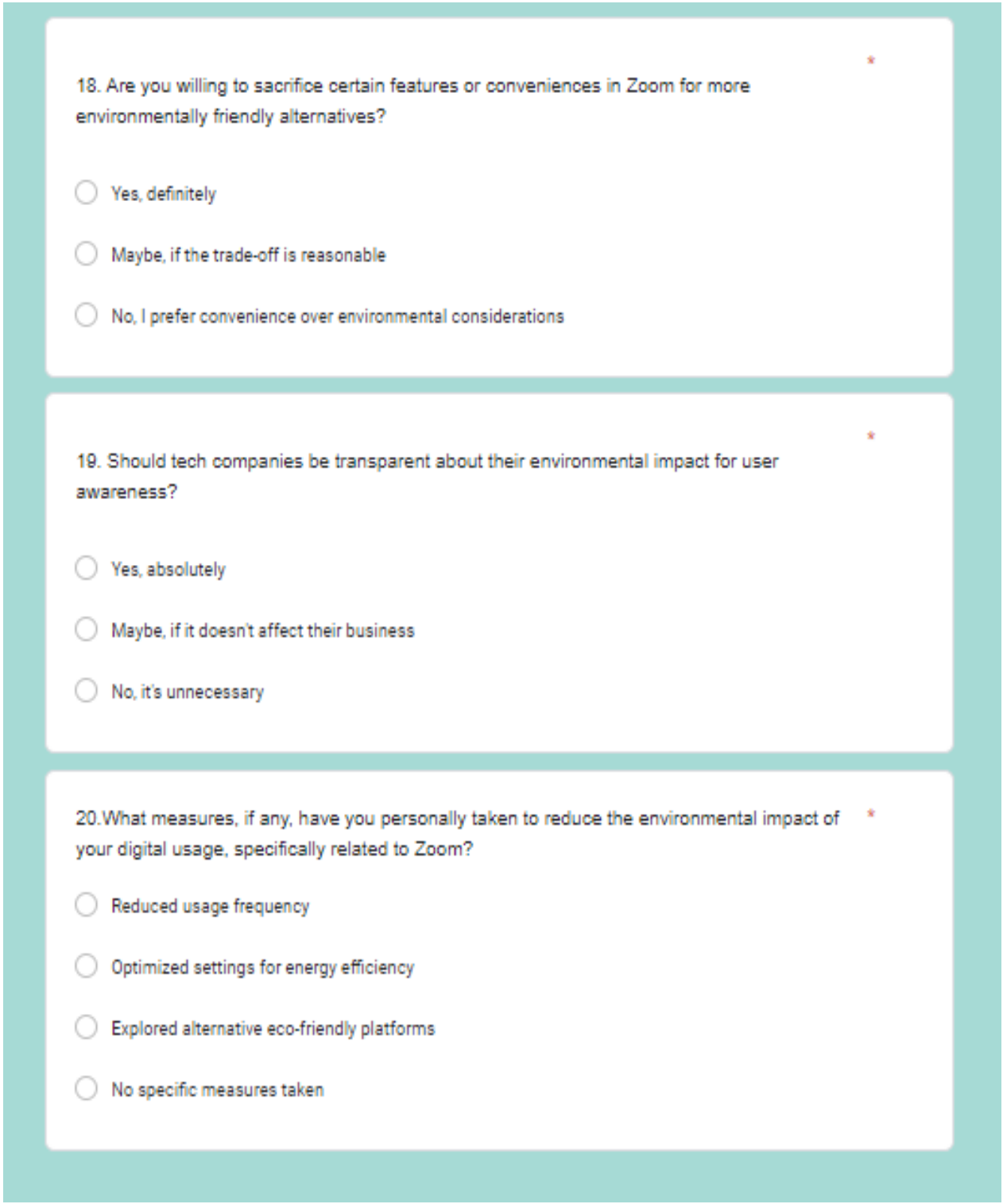
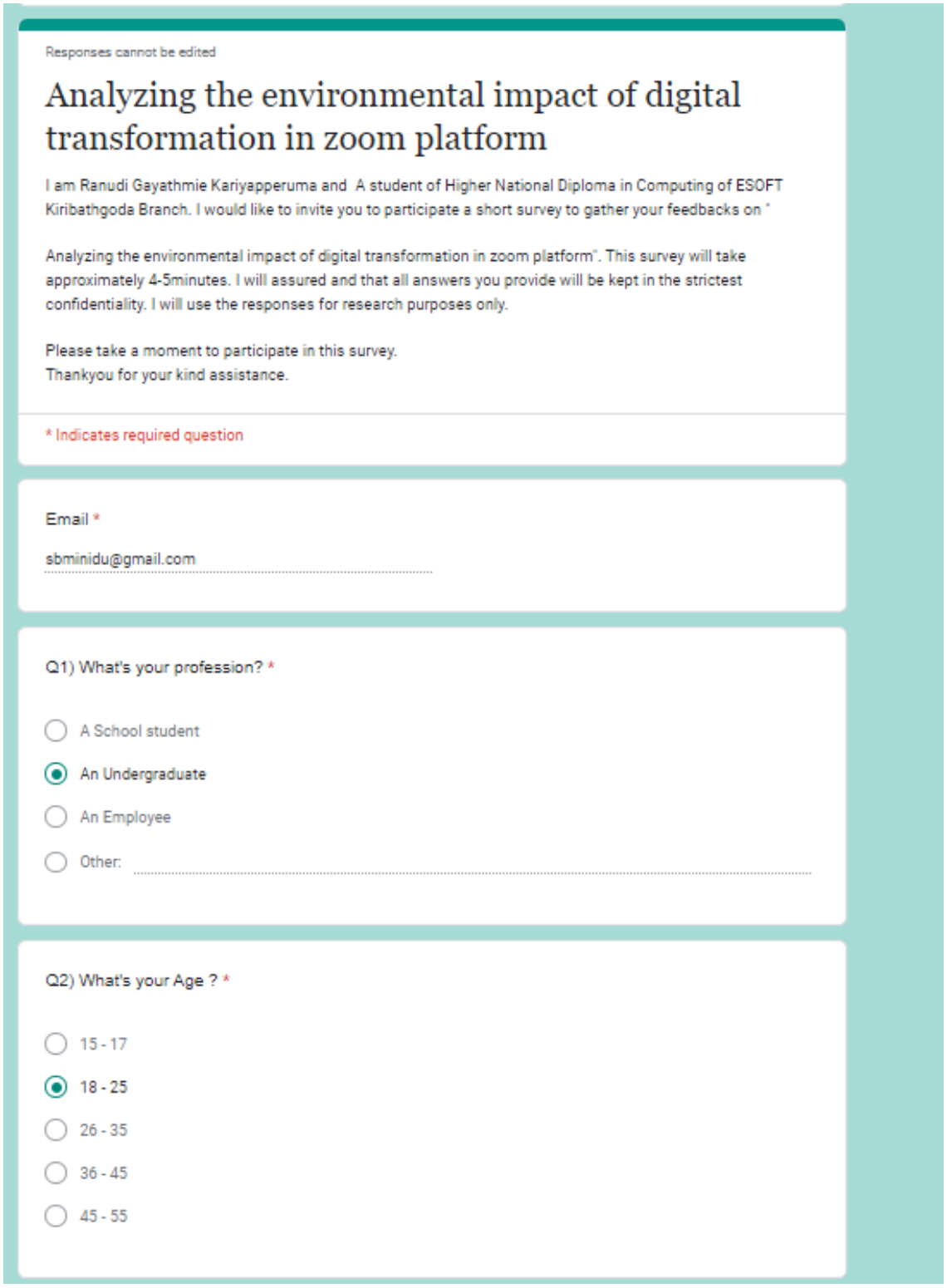


Figure 61: Questin form 7

Annexures D: Sample Feedback sheets

Sample 1



Responses cannot be edited

Analyzing the environmental impact of digital transformation in zoom platform

I am Ranudi Gayathmie Kariyapperuma and A student of Higher National Diploma in Computing of ESOFT Kiribathgoda Branch. I would like to invite you to participate a short survey to gather your feedbacks on "

Analyzing the environmental impact of digital transformation in zoom platform". This survey will take approximately 4-5minutes. I will assured and that all answers you provide will be kept in the strictest confidentiality. I will use the responses for research purposes only.

Please take a moment to participate in this survey.
Thankyou for your kind assistance.

* Indicates required question

Email *

sbminidu@gmail.com

Q1) What's your profession? *

- A School student
- An Undergraduate
- An Employee
- Other:

Q2) What's your Age ? *

- 15 - 17
- 18 - 25
- 26 - 35
- 36 - 45
- 45 - 55

Figure 62 : Sample page 1

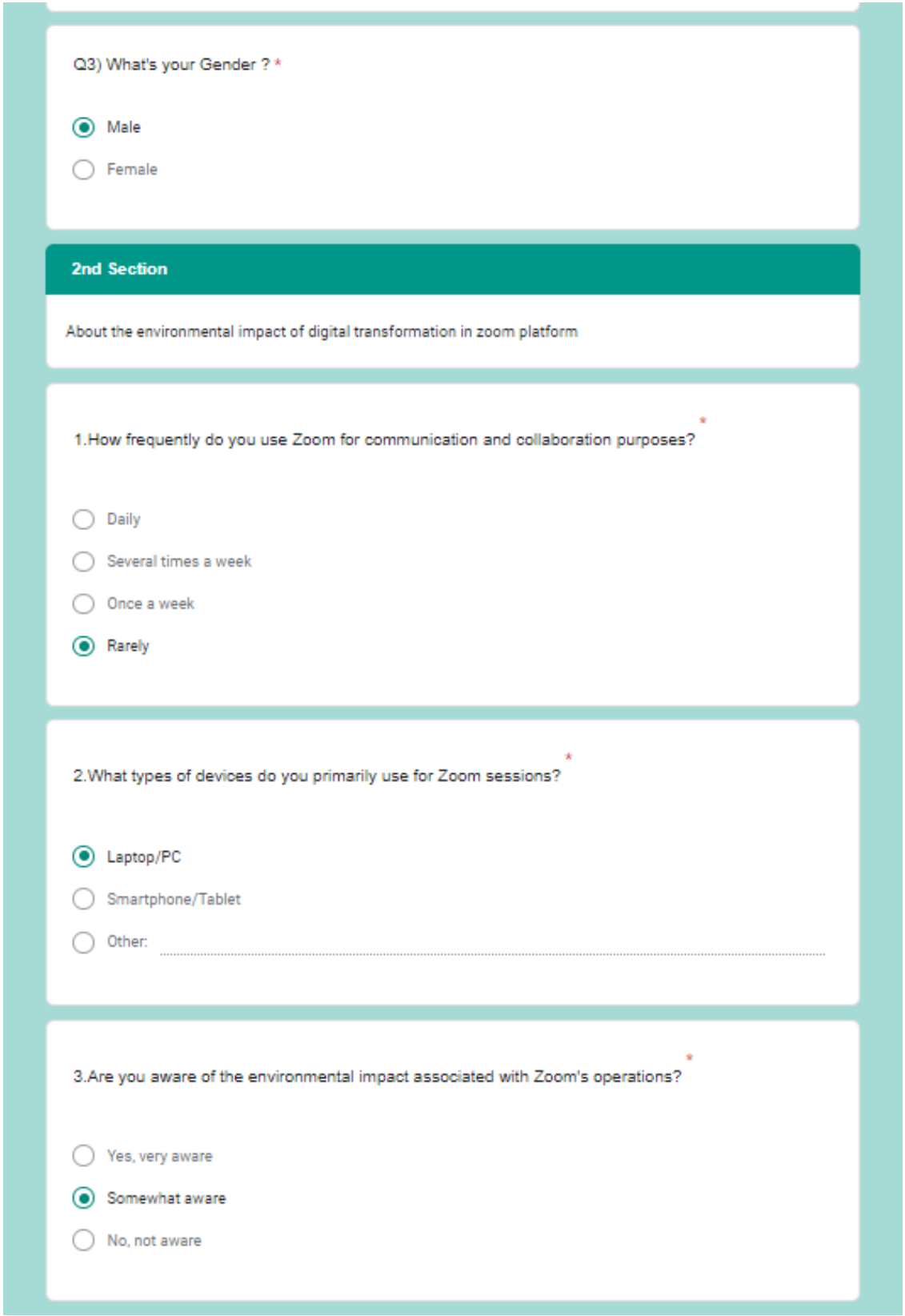


Figure 63 : Sample 1 page 2

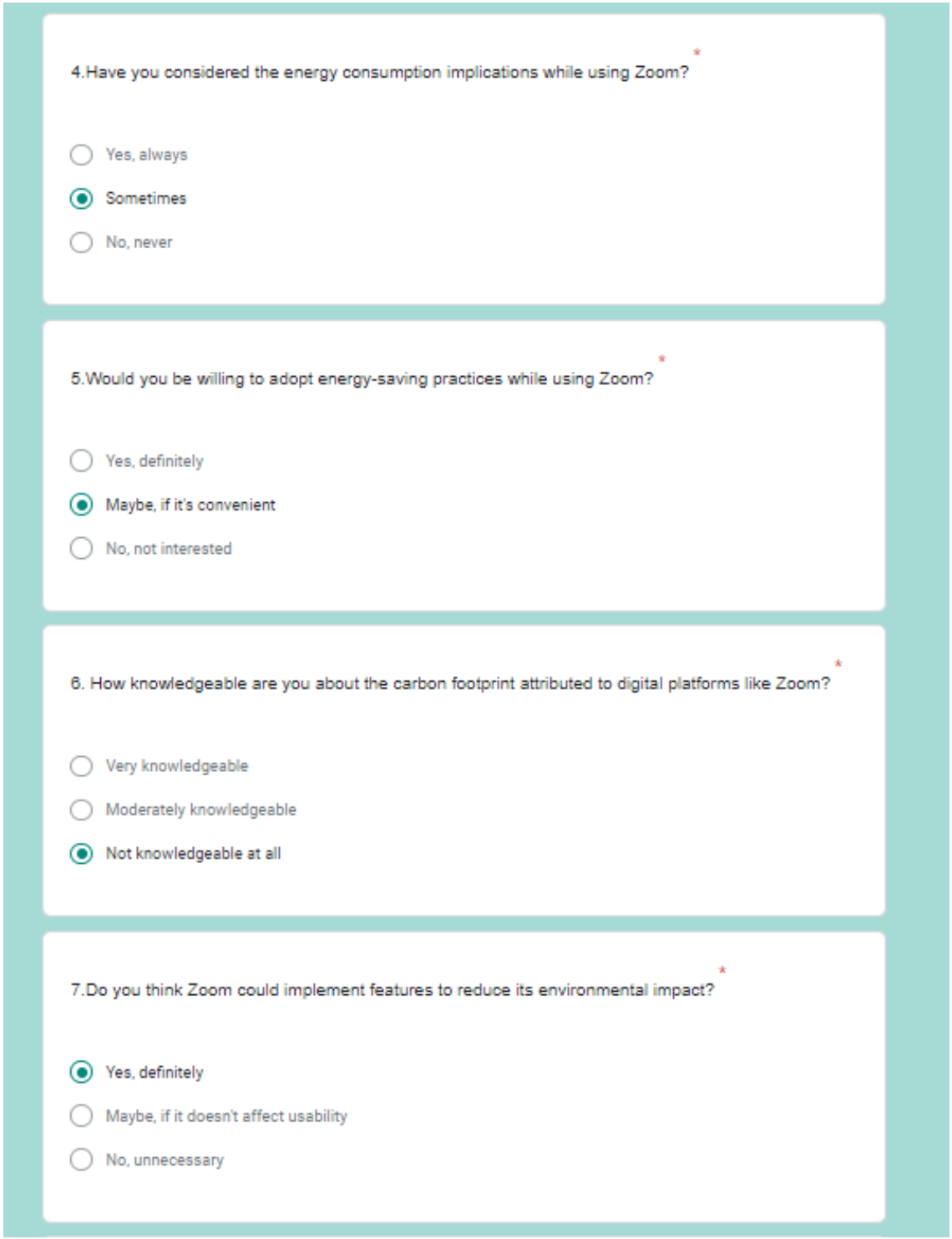


Figure 64 : Sample 1 page 3

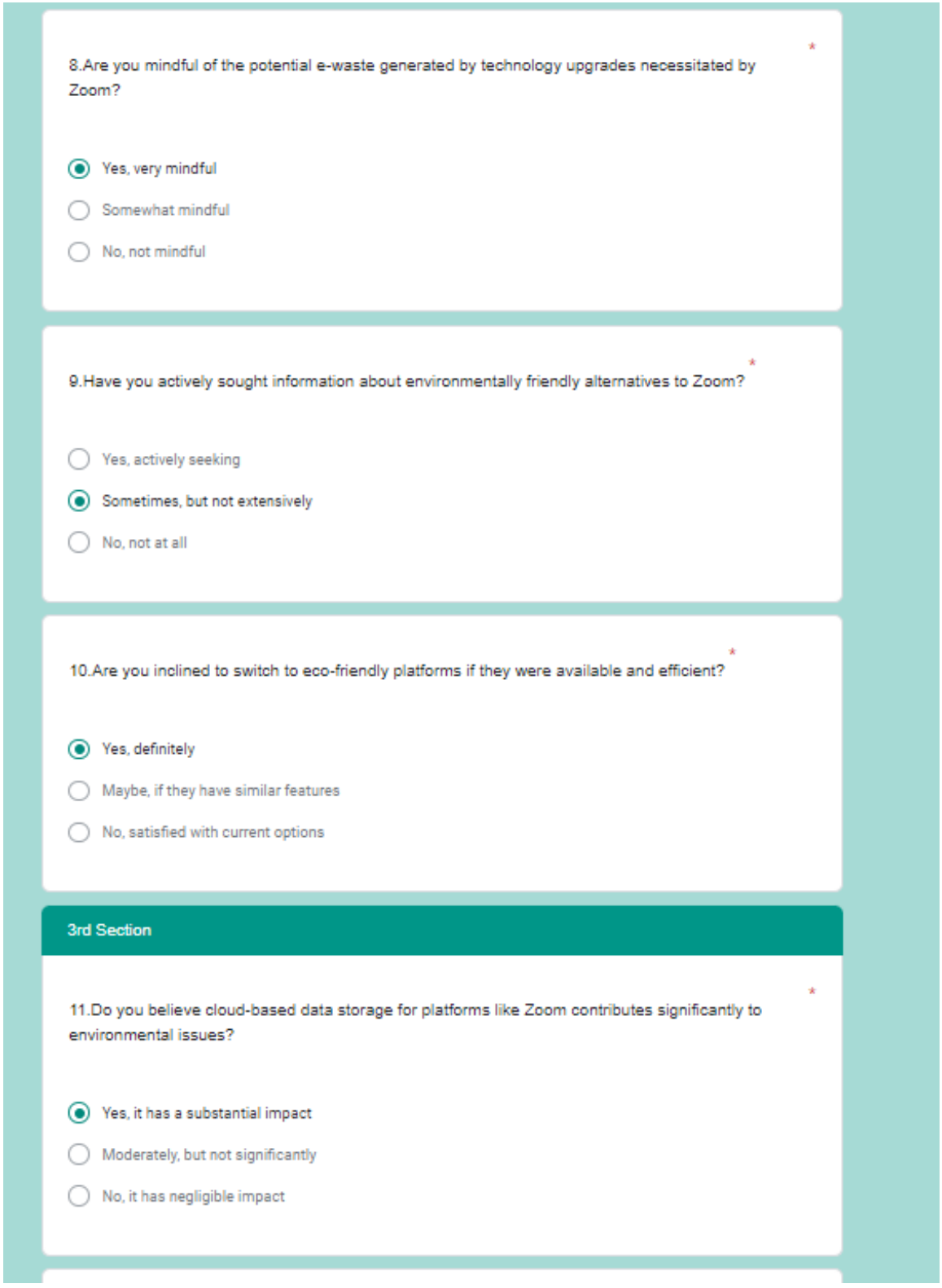


Figure 65 : Sample 1 page 4

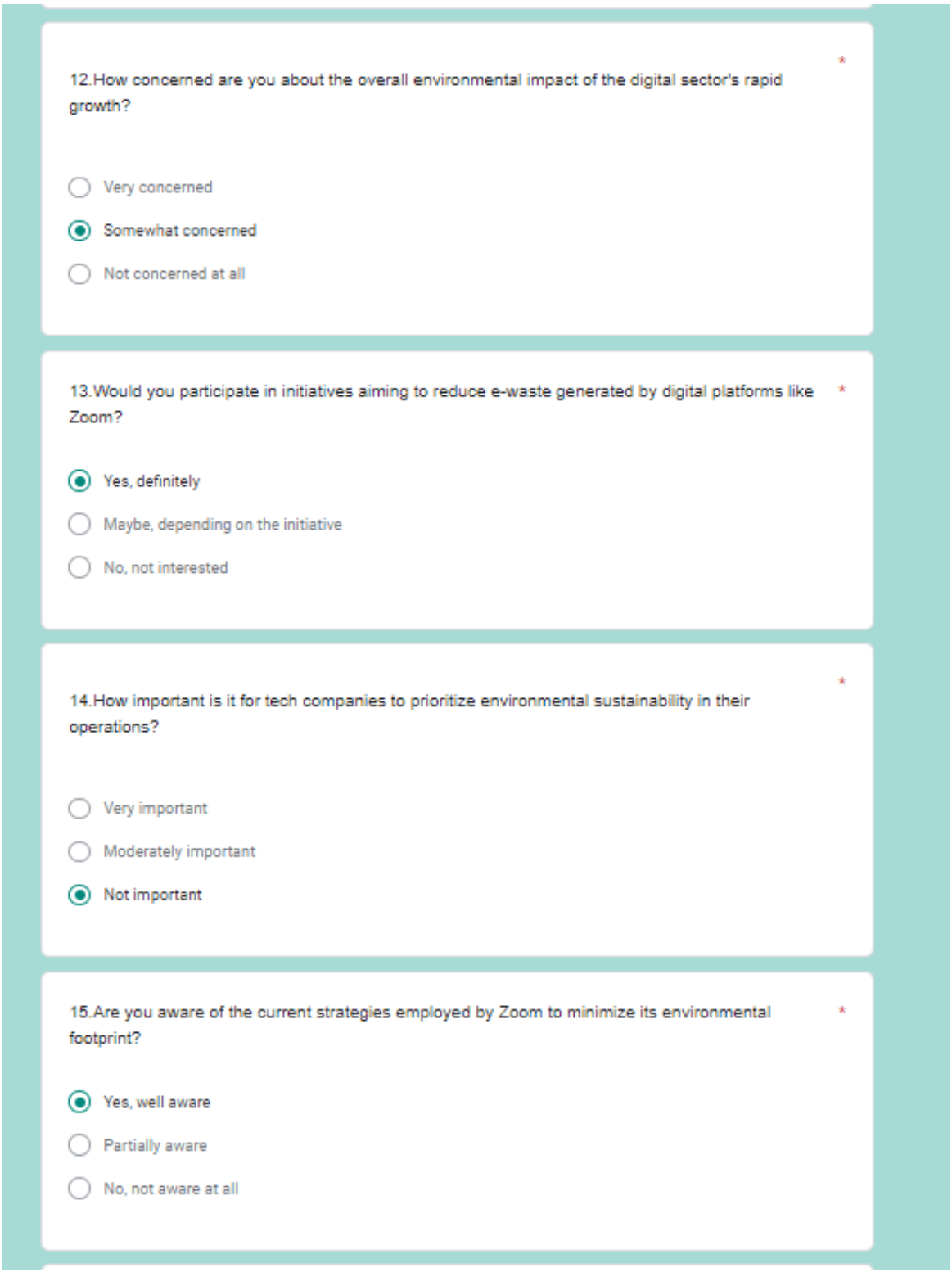


Figure 66 : Sample 1 page 5

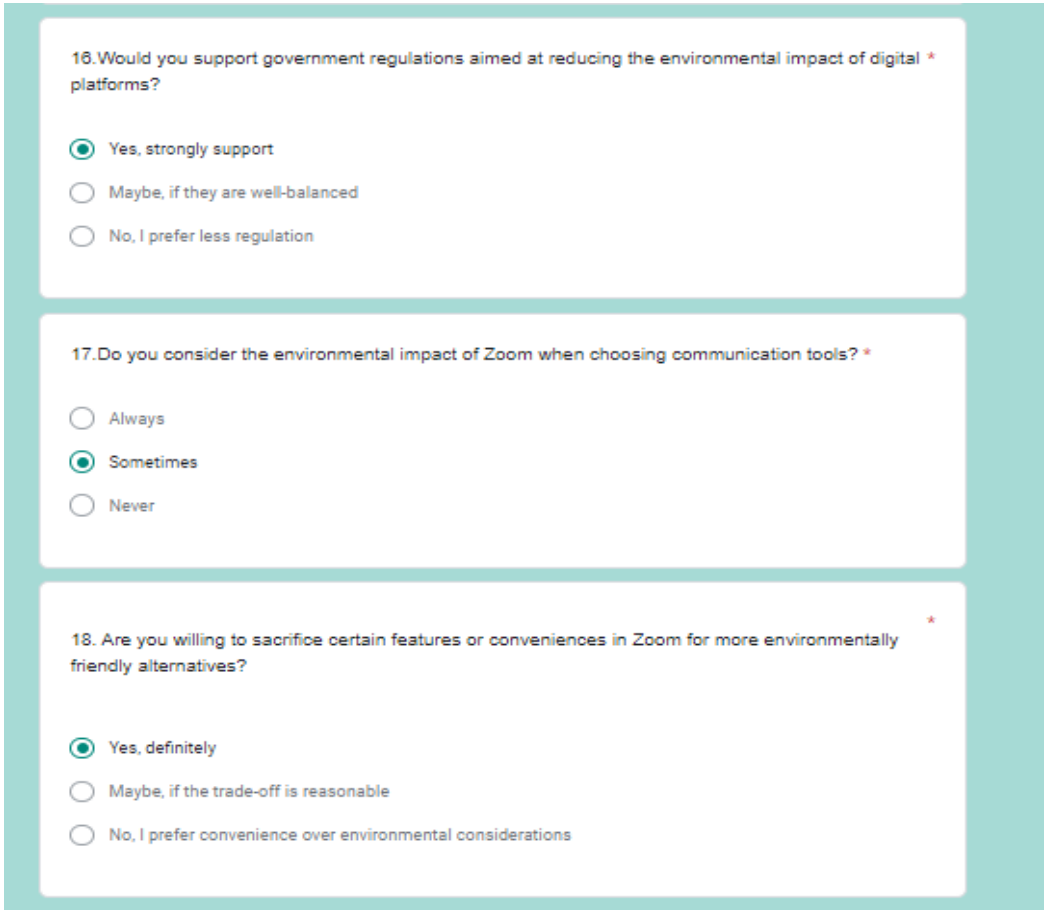


Figure 67 : Sample 1 page 6

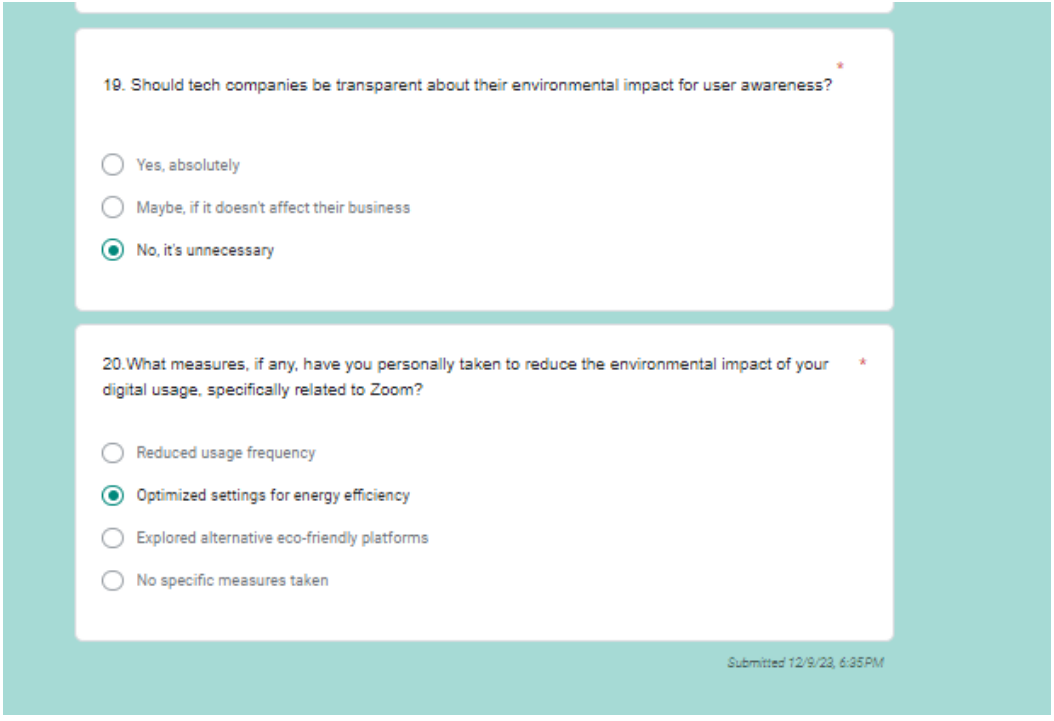
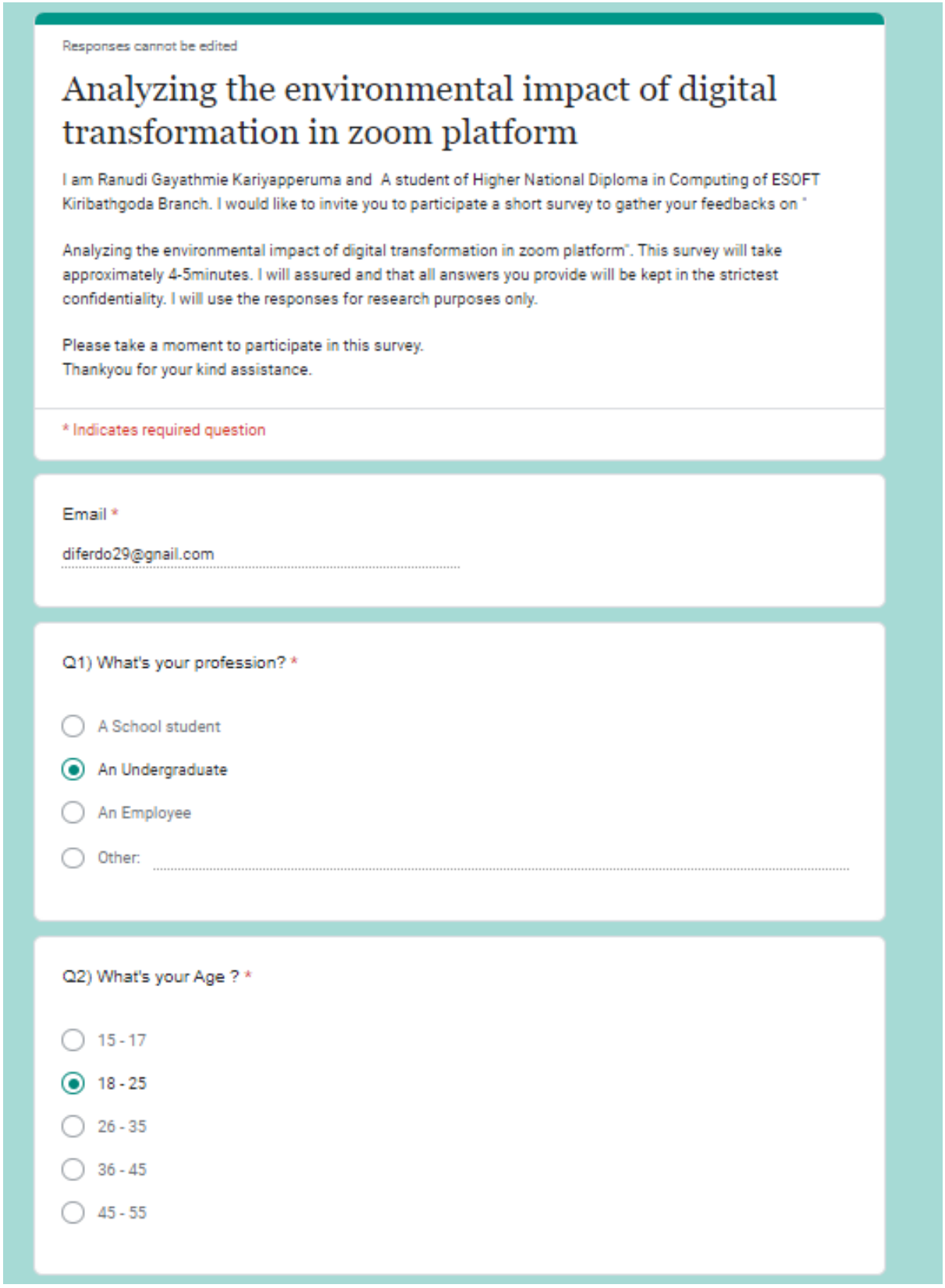


Figure 68 : Sample 1 page 7

Sample 2



Responses cannot be edited

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Please take a moment to participate in this survey.
Thankyou for your kind assistance.

* Indicates required question

Email *

diferdo29@gnail.com

Q1) What's your profession? *

- A School student
- An Undergraduate
- An Employee
- Other:

Q2) What's your Age ? *

- 15 - 17
- 18 - 25
- 26 - 35
- 36 - 45
- 45 - 55

Figure 69 : Sample 2 page 1

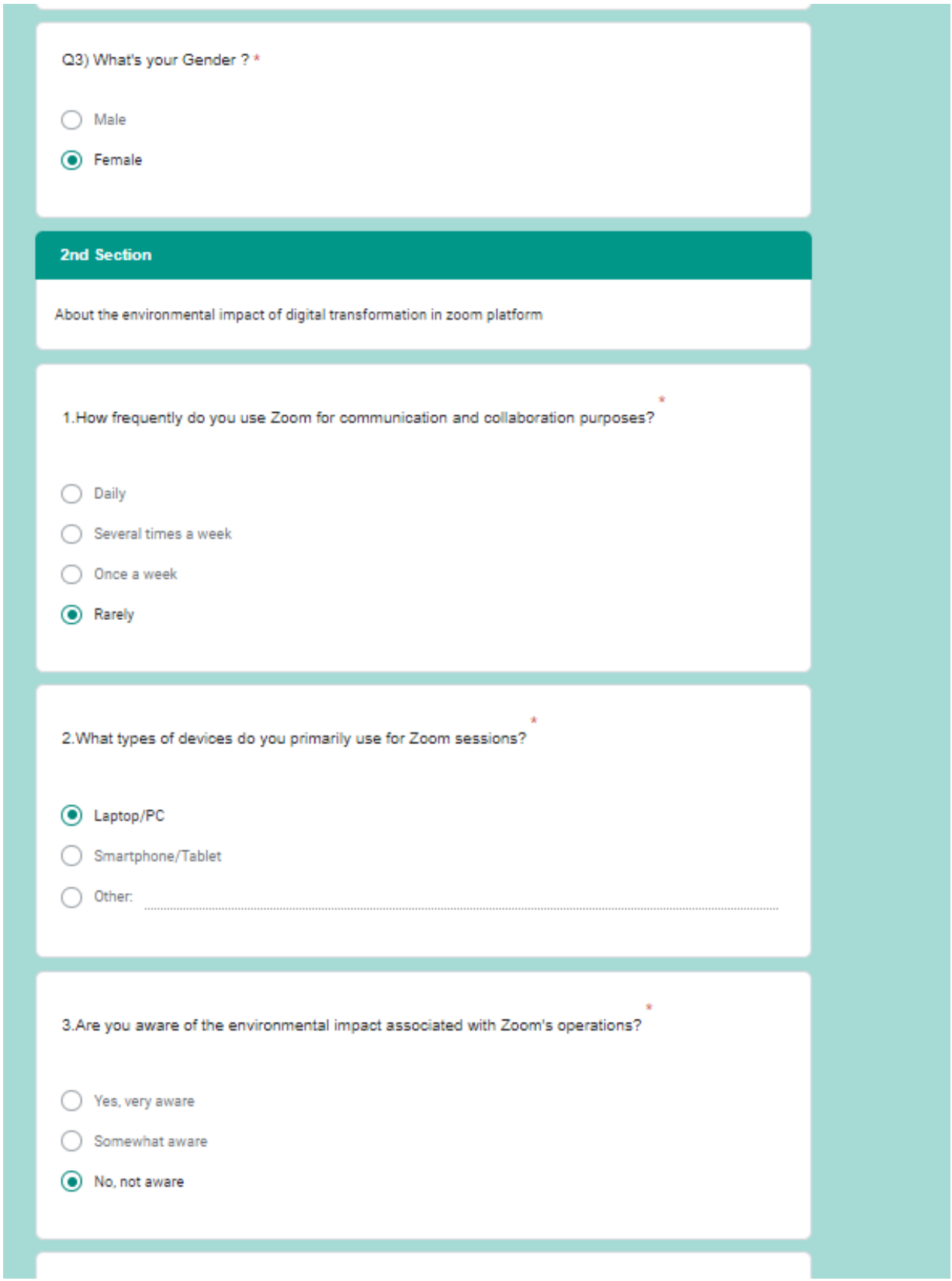


Figure 70 : Sample 2 page 3

4.Have you considered the energy consumption implications while using Zoom? *

- ○ Yes, always
- ◉ Sometimes
- ○ No, never

5.Would you be willing to adopt energy-saving practices while using Zoom? *

- ◉ Yes, definitely
- ○ Maybe, if it's convenient
- ○ No, not interested

6. How knowledgeable are you about the carbon footprint attributed to digital platforms like Zoom? *

- ○ Very knowledgeable
- ○ Moderately knowledgeable
- ◉ Not knowledgeable at all

7.Do you think Zoom could implement features to reduce its environmental impact? *

- ○ Yes, definitely
- ◉ Maybe, if it doesn't affect usability
- ○ No, unnecessary

Figure 71 : Sample 2 page 4

8.Are you mindful of the potential e-waste generated by technology upgrades necessitated by Zoom? *

- ○ Yes, very mindful
- ◉ Somewhat mindful
- ○ No, not mindful

9.Have you actively sought information about environmentally friendly alternatives to Zoom? *

- ○ Yes, actively seeking
- ○ Sometimes, but not extensively
- ◉ No, not at all

10.Are you inclined to switch to eco-friendly platforms if they were available and efficient? *

- ◉ Yes, definitely
- ○ Maybe, if they have similar features
- ○ No, satisfied with current options

3rd Section

11.Do you believe cloud-based data storage for platforms like Zoom contributes significantly to environmental issues? *

- ○ Yes, it has a substantial impact
- ◉ Moderately, but not significantly
- ○ No, it has negligible impact

Figure 72 : Sample 2 page 5

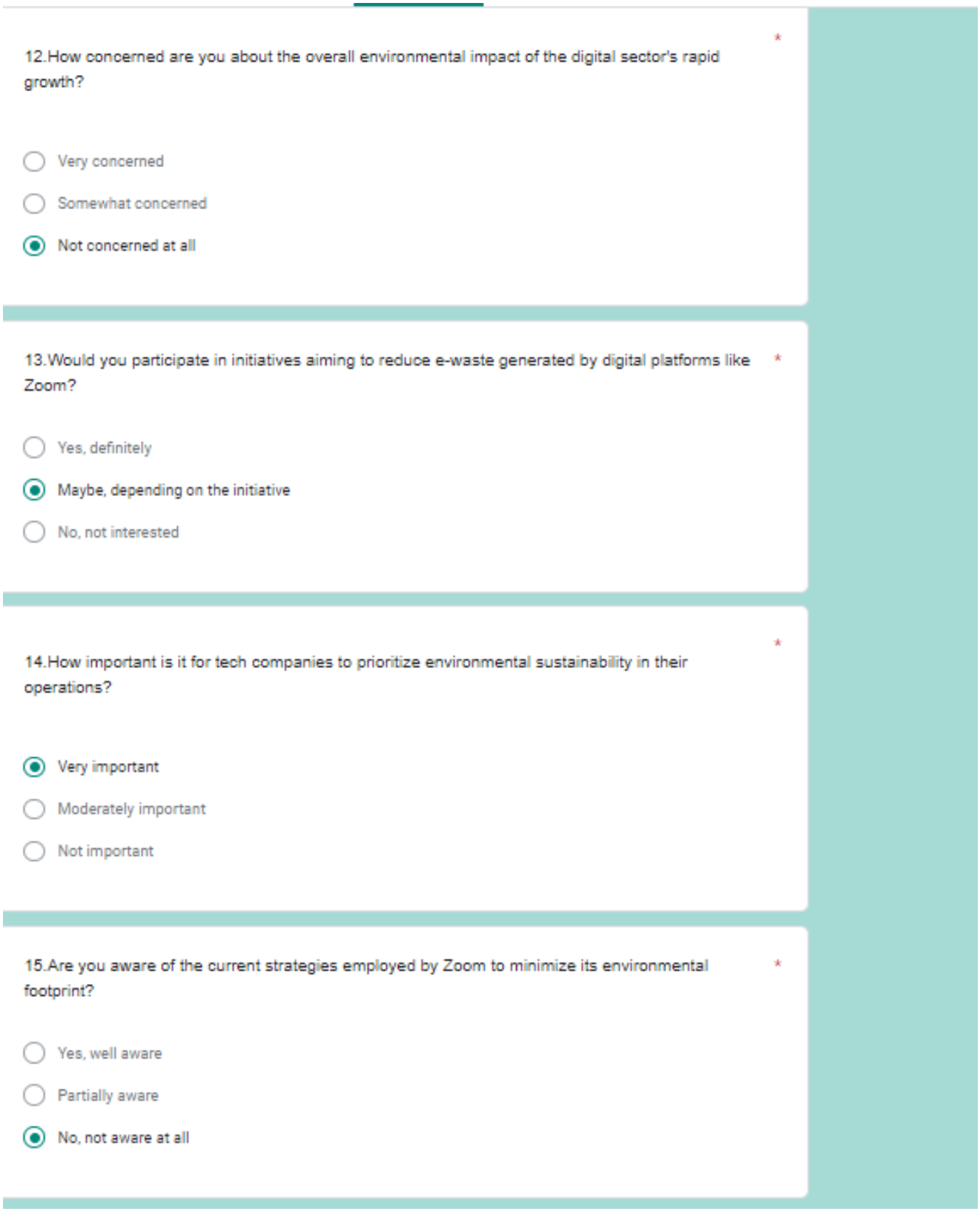


Figure 73 : Sample 2 page 6

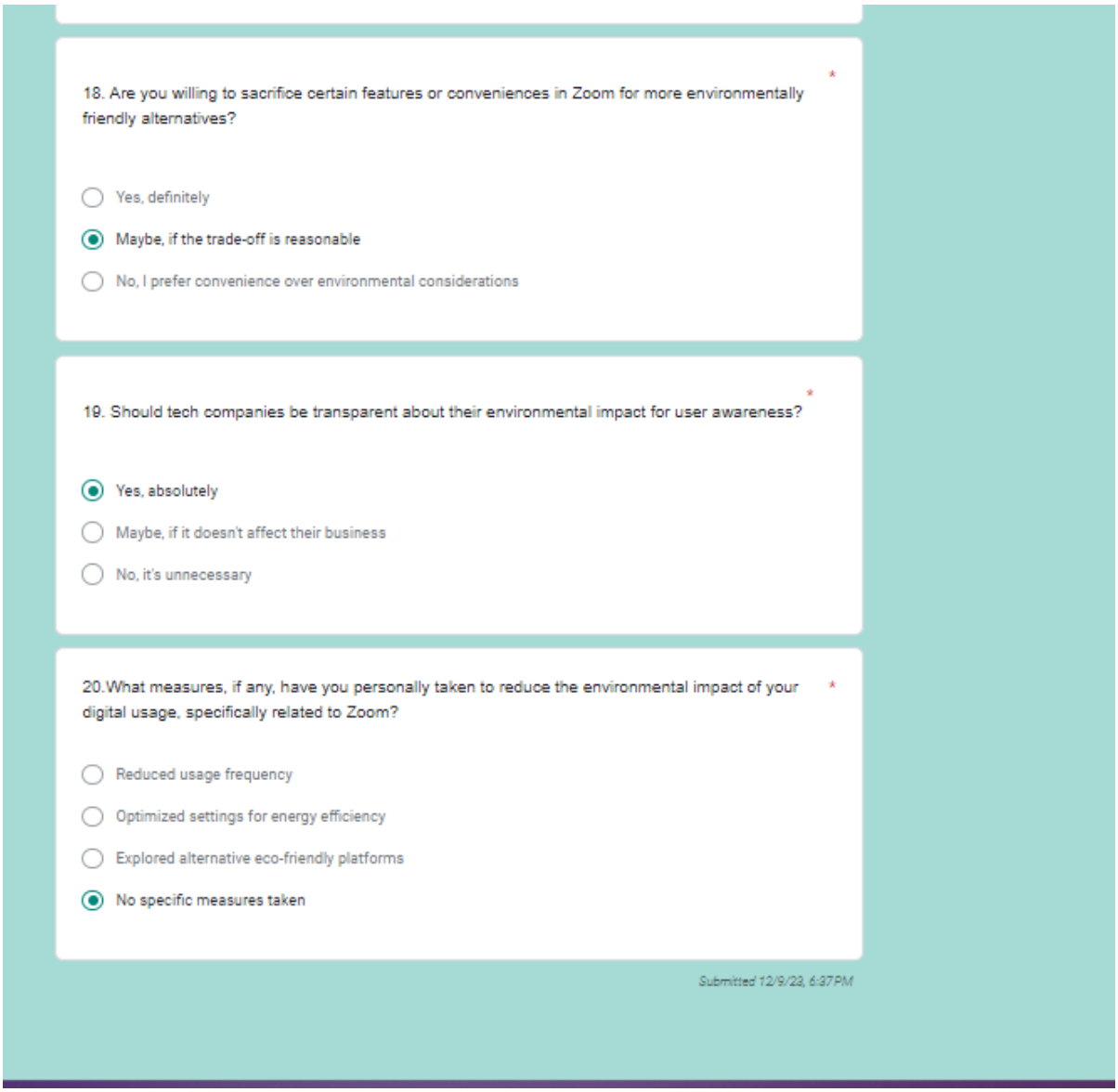
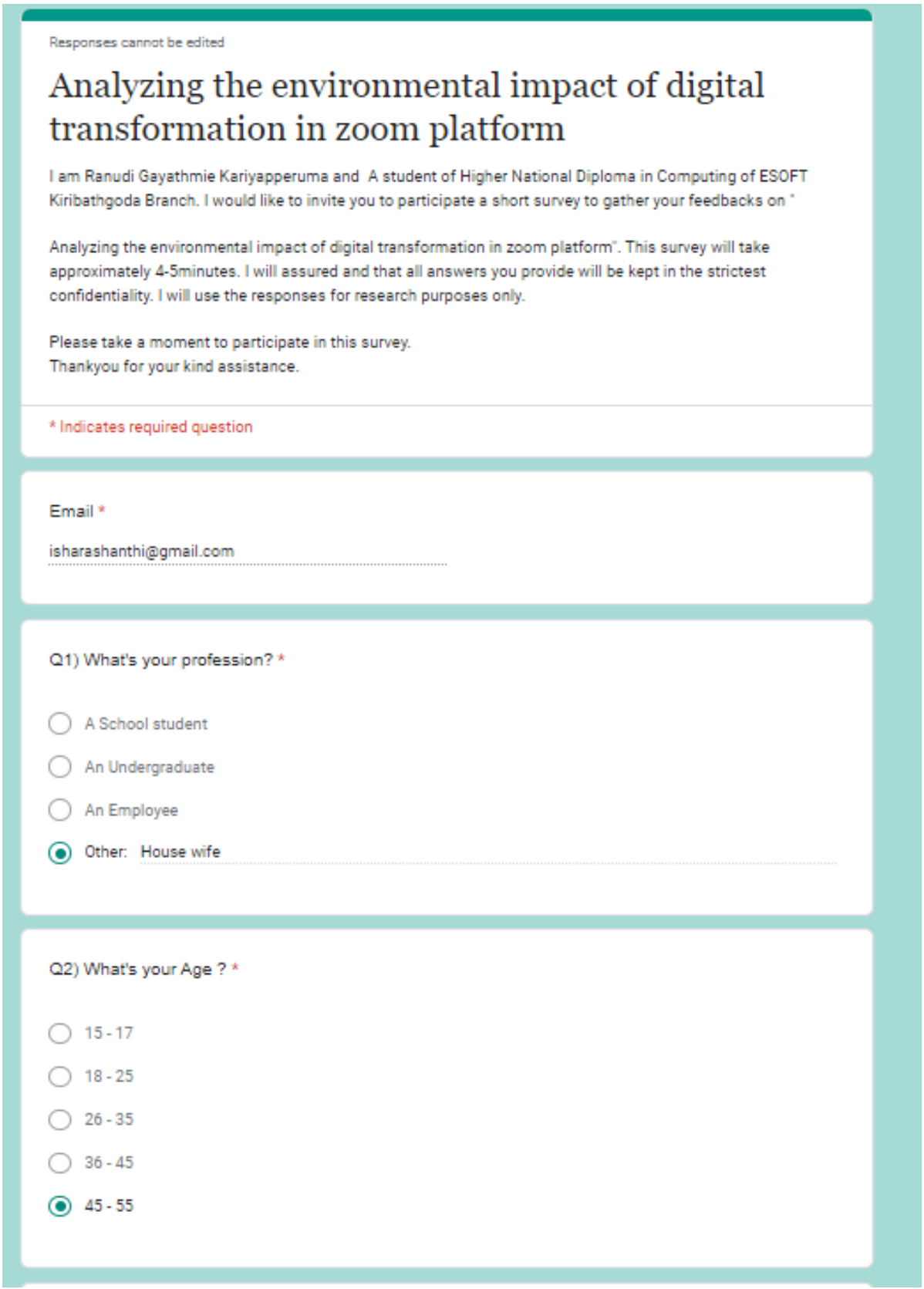


Figure 74 : Sample 2 page 7

Sample 3



Responses cannot be edited

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Please take a moment to participate in this survey.
Thankyou for your kind assistance.

* Indicates required question

Email *

isharashanthi@gmail.com

Q1) What's your profession? *

- ○ A School student
- ○ An Undergraduate
- ○ An Employee
- ◉ Other: House wife

Q2) What's your Age ? *

- ○ 15 - 17
- ○ 18 - 25
- ○ 26 - 35
- ○ 36 - 45
- ◉ 45 - 55

Figure 75 : Sample 3 page 1

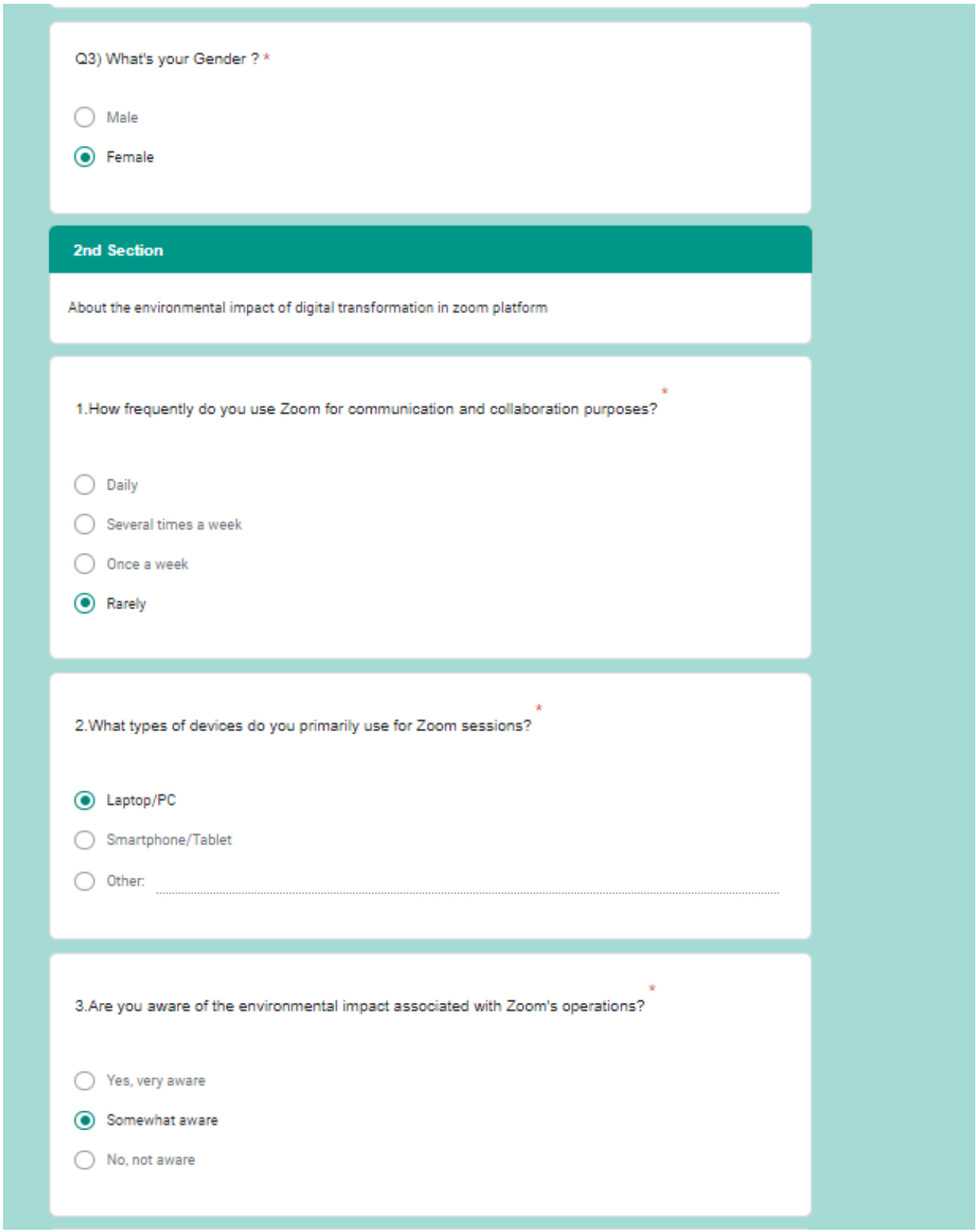


Figure 76 : Sample 3 page 2

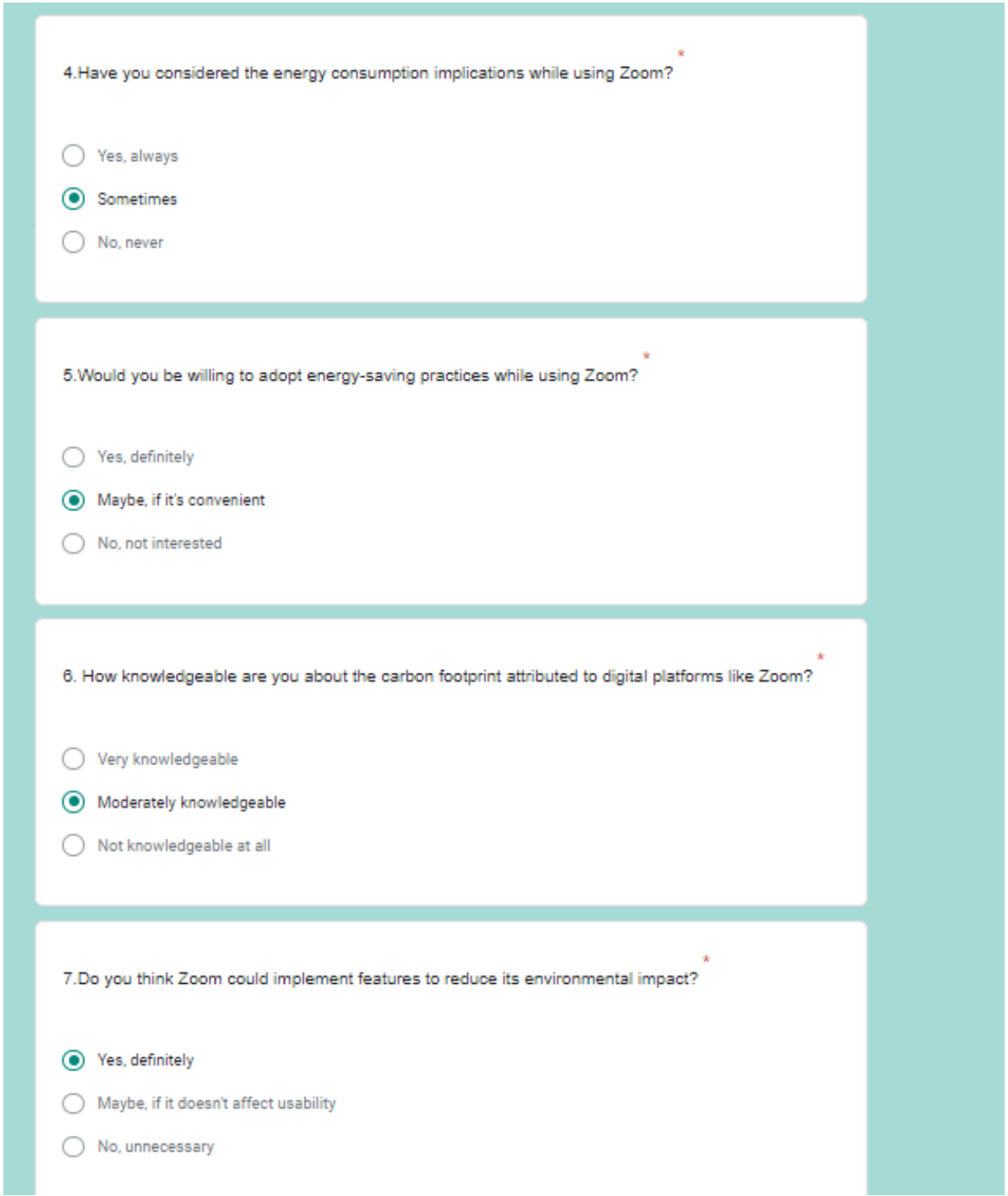


Figure 77 : Sample 3 page 3

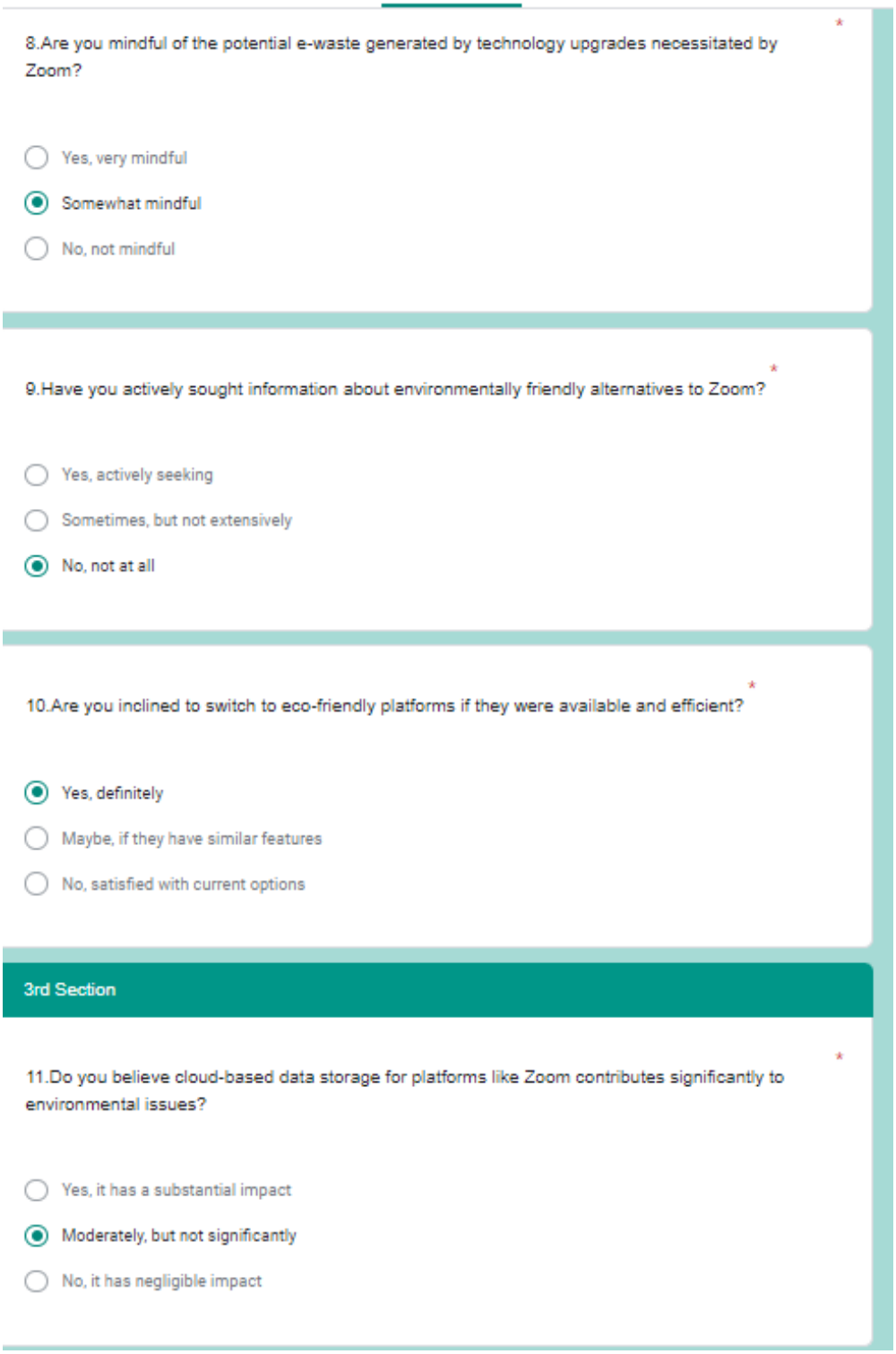


Figure 78 : Sample 3 page 4

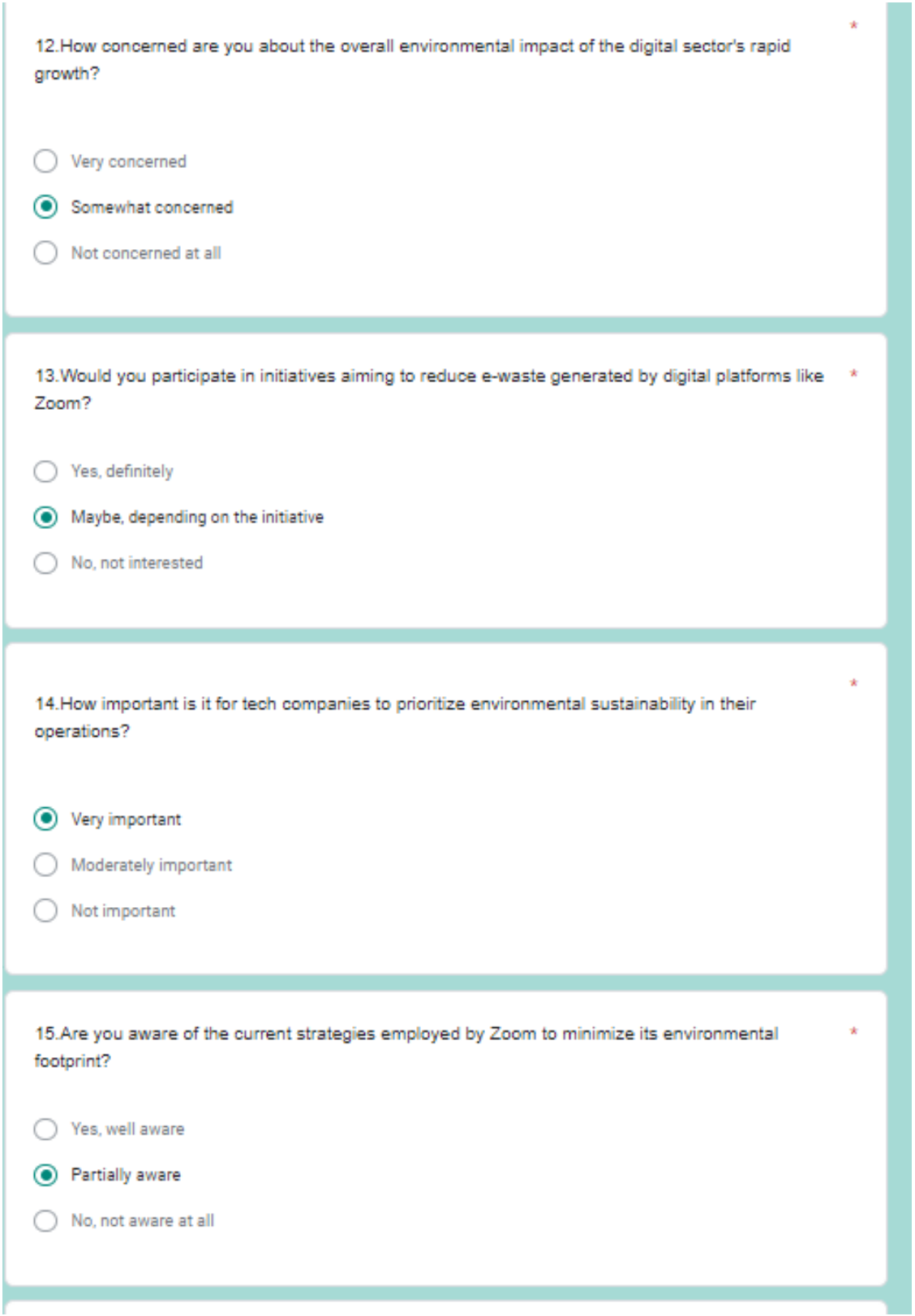


Figure 79 : Sample 3 page 5

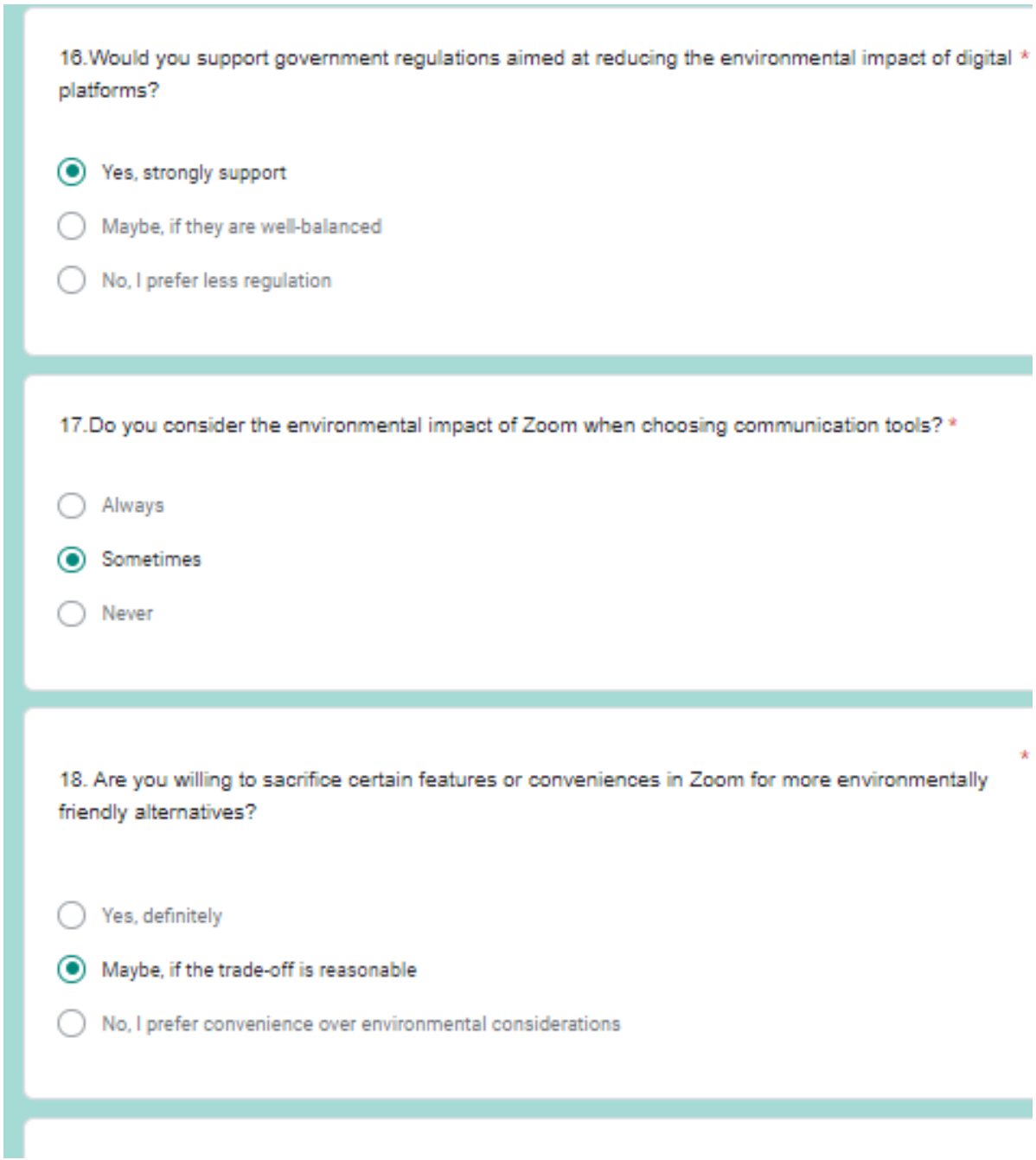


Figure 80 : Sample 3 page 6

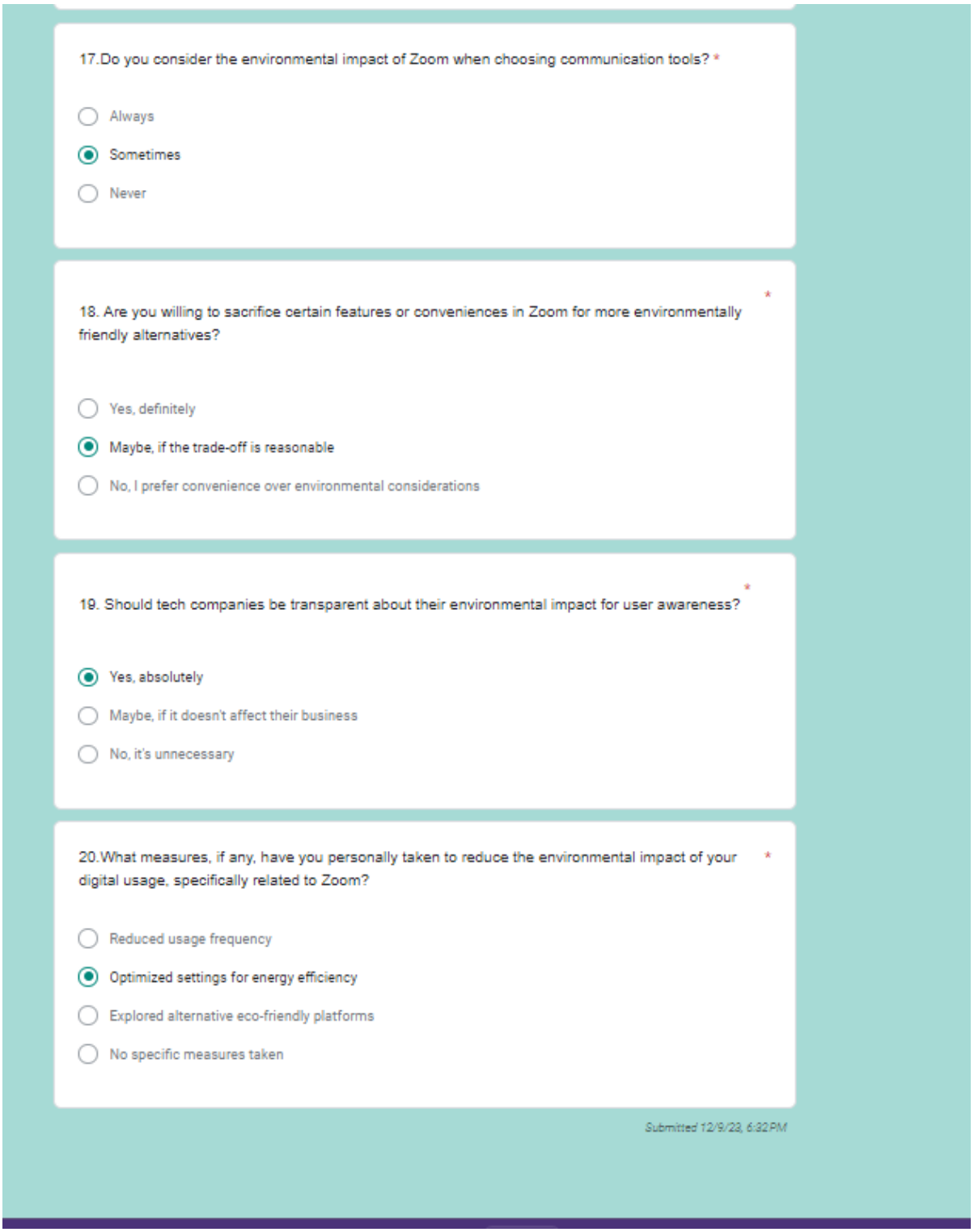


Figure 81 : Sample 3 page 7

Template for Evidence Collection

The Project Logbook Template

Name: Ranudi Gayathmie Kariyapperuma
Project title: The environmental impact of digital transformation in zoom platform
Date: 21.09.2023
Update on weekly research/tasks achieved Points to consider: What have you completed? • The author completed the proposal and the final report of the research. Did you fulfill task requirements? • Yes Are you on track and within deadlines set? • Yes Did you need to make any changes to your project management plan? • No
Any risks and/or issues identified? **Points to consider:** Did you identify risks/issues with a lack of skills required for undertaking research/tasks? Yes .Author have identify the issues withlack of skills during the research.The issue is that didn't know how to analyse the data in SPSS software and also didn't understand about to write the literature review. Did you identify any additional risks/issues that have an impact on the project management plan? No.

Problem encountered

Points to consider:

What barriers did you face?

Author didn't know how to analyse the data .Also author has to faced challenges of finding research papers on exact same research topic.

How did you overcome them?

By dividing sections from the research topic and then search with the keywords from the research topic also by self studies it helps author to do these things .

New ideas and changes of project direction

Author looked into a few creative ideas to improve the environmental impact study on Zoom's digital transformation in Sri Lanka. Author also saw possible changes in the project's course to include advanced data analysis methods, which might provide more in-depth understanding of the effects on the environment.

What have I learnt about myself this week?

Learn about how to write a literature review and to write research methodologies. Also to got data from people for the research with google forms.

Points to consider:

How did I feel when I had to deal with tasks/problems?

Author felt inspired and challenged as author worked through the tasks. Taking on challenging issues inspired a will to overcome difficulties and find solutions, which made every activity important and enjoyable when completed.

Did I find it useful to complete the tasks?

Yes. Actually, It was really helpful to finish these tasks as it made a big difference in the research. The author did well in developing thoughtful literature reviews, improving

techniques, and creating plans for gathering data. These efforts attempt to ensure the reliability and validity of the research.

How well have I performed? What did I contribute?

Based on my performance evaluation author feel that author made an important contribution to the study concerning the environmental effects of digital transformation in Sri Lanka through the Zoom platform. Author put a lot of time and energy into a number of projects, such as improving the literature review, setting out the steps, and getting ready to collect data. The purpose of this contribution was to build the methodology and base of the research, ensuring its validity and usefulness.

What can I improve on next week?

The author want to continue to improve my data analysis abilities next week. Author hope to get a more complicated understand of the data by exploring more advanced statistical techniques, which will improve the research findings. In addition, Author want to make sure that the information got is correct and complete by improving the data collection process.

How might this learning apply in the future?

Future applications focus greatly on the lessons learned from this week's activities. Future studies aiming for more thorough and significant results will benefit greatly from the improved skills in analysis and improved study methods that have been achieved. Furthermore, the problem-solving skills learned at this stage will be useful in overcoming challenges in later research tasks, confirming their success and credibility.

Tasks planned for next week

More research on analysing part and how to analyse the data .

Points to consider:

Which tasks are priorities?

Data Analysing part like regression and correlations

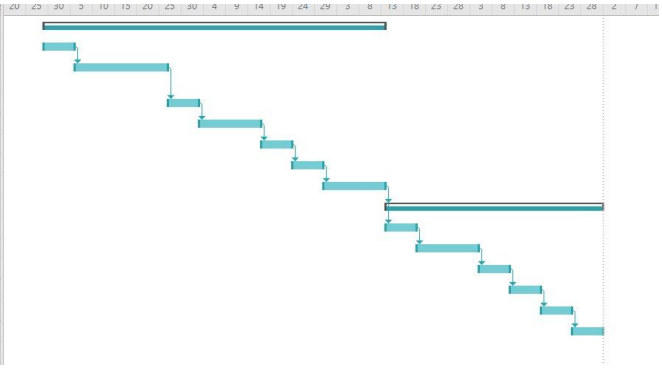
Have you set aside sufficient time for completion?

Like 3 weeks for this

Project plan status to date (on, ahead, behind)

This is the Gantt chart from the beginning of the assignment until to the finished date.

Task Name	Duration	Start	Finish	Predeces
Creating the Proposal	**11 wks**	**Thu 6/29/23**	**Wed 9/13/23**	
Introduction	1 wk	Thu 6/29/23	Wed 7/5/23	
Setting Research Title, Problem Statement,Objectives, SubQuestions	3 wks	Thu 7/6/23	Wed 7/26/23	2
Proposing Methodology	1 wk	Thu 7/27/23	Wed 8/2/23	3
Literature Review	2 wks	Thu 8/3/23	Wed 8/16/23	4
Setting the Research Ethics	1 wk	Thu 8/17/23	Wed 8/23/23	5
Estimations	1 wk	Thu 8/24/23	Wed 8/30/23	6
Getting the Approval	2 wks	Thu 8/31/23	Wed 9/13/23	7
Conducting the Research	**7 wks**	**Thu 9/14/23**	**Wed 11/1/23**	**8**
Creating & Distributing Questionnaires	1 wk	Thu 9/14/23	Wed 9/20/23	8
Collecting Data	2 wks	Thu 9/21/23	Wed 10/4/23	10
Analysing Data	1 wk	Thu 10/5/23	Wed 10/11/23	11
Conclusion	1 wk	Thu 10/12/23	Wed 10/18/23	12
Recommendations	1 wk	Thu 10/19/23	Wed 10/25/23	13
Preparing the Document	1 wk	Thu 10/26/23	Wed 11/1/23	14



Supervisor comments to address

Grading Rubric

Grading Criteria	Achieved	Feedback
P1 Produce a research proposal that clearly defines a research question or hypothesis, supported by a literature review		
P2 Examine appropriate research methods and approaches to primary and secondary research.		
M1 Evaluate different research approaches and methodology and make justifications for the choice of methods selected based on philosophical/ theoretical frameworks.		
D1 Critically evaluate research methodologies and processes in application to a computing research project to justify chosen research methods and analysis.		

Grading Criteria	Achieved	Feedback
P3 Conduct primary and secondary research using appropriate methods for a computing research project that consider costs, access and ethical issues		
P4 Apply appropriate analytical tools to analyse research findings and data.		
M2 Discuss merits, limitations and pitfalls of approaches to data collection and analysis.		
P5 Communicate research outcomes in an appropriate manner for the intended audience.		
M3 Coherently and logically communicate outcomes to the intended audience, demonstrating how outcomes meet set research objectives.		
D2 Communicate critical analysis of the outcomes and make valid, justified recommendations.		
P6 Reflect on the effectiveness of research methods applied for meeting objectives of the computing research project.		
P7 Consider alternative research methodologies and lessons learnt in view of the outcomes.		

M4 Provide critical reflection and insight that results in recommended actions for improvements and future research considerations.		
D3 Demonstrate reflection and engagement in the resource process leading to recommended actions for future improvement.		