National College of Ireland

The association between outdoor and indoor environmental factors affecting self-performance and productivity in foreign individuals living in Ireland

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Abstract

The aim of this study is to explore the relationship between different outdoor and indoor environmental factors and their impact on the self-performance and productivity levels of foreign individuals' living in Ireland.

This research seeks to delve into how factors such as weather conditions, access to green spaces, air quality, noise levels, indoor lighting, temperature, and living environments influence the ability of foreign residents to effectively perform tasks and maintain productivity at their workplaces and their daily basis.

Indoor environmental factors were also analysed, in terms of employees' satisfaction with the environment they work at, in other words, office buildings. This will help measure how productive they are in terms of satisfaction with personal workspace.

By focusing on foreign individuals, this study intention is to understand how cultural backgrounds and experiences may interact with environmental factors to shape self-performance and productivity. Through quantitative analysis, the research intends to uncover patterns, correlations, and potential causative relationships between environmental contexts and individual efficacy. The approach to this study was developed through a survey in where participants were asked questions about workplace conditions, housing conditions and a general self-efficacy questionnaire. In this study 70 participants were considered, females and males who belong to the same niche, they are all foreigners who have been living in Ireland for more than six months and who have a formal job.

Ultimately, the goal of this investigation is to provide insights that can inform urban planning, workplace design, and community initiatives aimed at optimizing environmental conditions to enhance the well-being and productivity of foreign residents in Ireland, thereby contributing to their integration and overall quality of life.

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Abbreviations

- IEQ: Indoor Environmental Quality
- SE: Self-Efficacy
- WPE: Workplace Environment
- HC: Housing Conditions
- SBS: Sick Building Syndrome
- IAQ: Indoor Air Quality
- AC: Artificial Air
- EAI: Endorsed Transactions on Pervasive Health and Technology
- NWND: Neither Window Neither Door
- QoL: Quality of Life
- SPSS: Statistical Package for Social Sciences

Chapter 1

1.0 Introduction

Favourable workplace and housing conditions are becoming key factors when promoting efficiency, productivity, and overall wellbeing on individuals' lives (van de Weijer, 2022). When refereeing to favourable workplace, the effective design of a workspace plays a role in creating a better working environment. Studies have shown that a well-designed office space promotes concentration, minimises stress, encourages teamwork and creativity, and boosts employee confidence. In addition, providing access to tools and resources acts as an incentive to improve productivity and team dynamics (Kang, Ou, and Mak, 2017). Correspondingly, housing conditions plays a pivotal role in individuals, the adequate space and privacy, supports physical health and wellbeing. Good HC reduces levels of anxiety and allows people to focus on their personal and professional life. A safe and comfortable living environment not only promotes individual happiness but also contributes to stronger communities and healthier societies (Bjorndal, *et al*., 2023). Investing in these conditions not only benefits individuals but also organisations and societies.

This research focuses on the relationship between the environmental conditions at individual's workplace and their environmental living conditions, and how these factors affect their performance and productivity. By reviewing existing research and developing the appropriate analysis, the aim of this study is to investigate whether there is real relationship between these variables and how they apply particularly in the context of a diverse population living in Ireland.

1.1 Background

During the last years, the environment on our planet has change dramatically. Nowadays we have been facing a huge negative impact on the environment also known as global warming or climate change. At the same time, the level of health and well-being problems on individuals increased in the last years as the deterioration of the environment evolved. According to the Grantham Institute investigation, “climate change and mental health are two of the most significant pressing challenges facing societies across the world” (Lawrence, E., Thompson, R., Fontana G., and Jennings N. pp 2, 2022), in which both issues are being overlooked by our governments and the society itself.

Extreme hot temperatures contribute negatively towards multiple areas such as economic output reduction, social conflicts, and violence. Climate changes could also cause alterations within people's physiological state affecting central nervous system functionalities; thus, causing cognitive inconsistencies leading to poor emotional experiences (Lawrence, E., *et al*., 2022). Impact on the environment it can also be described by pollution, soil, and visual contamination, among others. People that are exposed to these contaminants are more likely to present dissatisfaction of the places they are living in, which could bring depression problems in long term, and increases the chance of experience mental health problems. (Carleton, T. A. and Hsiang, S. M., 2016). Environmental conditions can alter the human performance of entire societies or of a country, interfering in aspects like economy, migration, and demographics problems.

For this reason, it is important to investigate how the association between outdoor and indoor environmental factors is affecting self-performance and productivity in people. The study will focus on the environmental factors at individual's workplace and housing conditions.

1.2 Research aims and objectives

This study aims to explore if there is a connection, between the workplace environment and the living conditions of individuals and how these impacts their performance and productivity. The researcher seeks to examine the results of this study by comparing them with existing research related to the subject, while also supporting each hypothesis whether null or positive.

Objective

The association between outdoor and indoor environmental factors affecting self-performance and productivity in foreign individuals living in Ireland.

Sub-objective 1: Investigate and identify the specific workplace environmental factors that have been shown to affect self-performance and productivity in foreign individuals living in Ireland.

Sub-objective 2: Analyse the influence of outdoor and indoor housing conditions on the self-performance and productivity of foreign individuals in Ireland.

Sub-objective 3: Evaluate how foreign individuals living in Ireland feel about their self-performance and productivity.

1.3 Purpose of the study

Understanding the connection, between environmental factors and the productivity of individuals in Ireland has significant implications. By identifying environmental elements that impact productivity, policymakers and city planners can make well informed decisions on housing standards and workplace settings to improve the well-being and productivity of foreign residents. Examining how housing conditions affect productivity can guide efforts to enhance living arrangements for individuals in Ireland creating an environment for personal and professional development. Understanding how foreign individuals perceive their productivity, offers insights into their experiences and challenges. Addressing these perceptions can increase their sense of belonging, integration, and overall well-being in society. Supporting the productivity of individuals contributes to their engagement and potential contributions to the Irish economy. This research can help develop strategies to leverage the talents and skills of this group fostering progress and diversity.

Customizing these programs to tackle obstacles and requirements highlighted in the research can help make the integration and adaptation processes more seamless. In conclusion, the findings of this study could assist in the design of policies that complement the quality of life, promote integration and well-being, stimulate growth, and inform the creation of intercultural support initiatives for foreign people living in Ireland. In light of these considerations, Ireland may be perceived as an increasingly attractive destination for those seeking to emigrate, as well as for its own residents who are currently seeking alternative opportunities and opting to leave the country

Chapter 2

2.0 Literature review

2.0.1 Literature review introduction

The aim of this literature review is to understand the important role of environmental factors in workplaces and living conditions in relation with self-efficacy and productivity of individuals. This literature delves into the effects of outdoor environmental quality (IEQ) on human performance focusing on their impact on productivity and self-performance in different environments. On the other hand, the relationship between indoor environmental factors and individual performance is as well an important area of study, with implications for workplace optimization. This review aims to examine existing studies to uncover the effects of these elements on individual performance and productivity. Beyond the workplace spaces, the influence of indoor and outdoor environmental factors in housing conditions of individuals cannot be overlooked. This review as well expands the discussion by exploring how housing conditions, contributes to individual self-efficacy and productivity. By combining existing literature about the topic, this review seeks to offer a comprehensive view of how environmental factors impact individual performance and efficiency. These findings are crucial, for developing interventions and policies based on evidence to improve life quality and productivity in environments and situations.

2.0.2 Indoor environmental factors in workplaces affecting self-performance and productivity of individuals.

The impact of indoor environmental quality (IEQ) on work productivity (Kang, Ou, and Mak, 2017) is evident and it being proven through research. Indoor environments need to be suitable for employees in terms of their health, comfort, and stability as most of them spend most of their days in the office, at least three times a week (Lan, L., Wargocki, P., Wyon, D. P., Lian, Z. 2011). According to Kang, Ou, and Mak (2017, p. 79), there are five components that are important for individual performance and

productivity at work, which are: "office layout, thermal environment, air quality, lighting environment, and acoustic environment".

Office layout

Currently, the construction of office buildings with an open-plan structure and consideration of the five previous components for the development of the physical space, has become more common, as it has been shown that this type of architecture has an important effect on the indoor environmental quality for employees', which affects their work productivity and performance (Kang, *et al.,* 2017). It has also been shown that there is a relationship between indoor factors and employee's personality types (Seddigh, Berntson, Platts and Westerlund, 2016). For example, studies have shown that people who are more prone to distraction, are more likely to experience a lack of concentration more easily in open office layouts, since this layout reduces their privacy. The open space layout also results in a smaller workspace for each occupant, reduced visual privacy, and generates unplanned social interactions and interruptions accompanied by the inadequate acoustic environment (Aboulfotouh, *et al*., 2022). On the other side, extroverted people are more related to an open space setting as they can interact more with their colleagues, and this generates greater job satisfaction for them. This type of office layout is helpful when it comes to communicate with coworkers. Another study reveals that people with a higher index of extrovert, tend to be more satisfied with the facility they have to communicate within the office and the interaction they can create with their colleagues and managers, (Seddigh, *et al.,* 2016). The feedback received is more honest and direct when faced with a person face to face than when it is done virtually. In relation to employees' working in cell offices, it has been shown that they feel more comfortable regarding their health, because they exhibit low incidences of diseases that are transmissible within the office environment. (Seddigh, *et al.,* 2016). This gradually generates greater job satisfaction and better performance, compared to the rates of people who work in open layout.

Another significant factor in terms of layout is the location of the desk. It has been proven that there is a significant difference in job satisfaction in people who are located at a desk near a window or a door than people who are not in any of these situations. People who are near a window or a door have access to greater ventilation and better natural light, but at the same time, they face more distractions such as noises or external phenomena that reduce concentration (Mak and Lui, 2012). The results of

previous studies have indicated that people with the lowest productivity rate were those who are easily distracted by noise sources such as background noise, human activity, and other external sounds.

Thermal environment

The second important factor affecting individuals' performance and productivity in the workplace is thermal environment. According to Kang, Ou, and Mak (2017), thermal environment has been analysed as one of the causes of people's discomfort in their work performance. There are several studies in which the behaviour of individuals in relation to the temperature in offices has been analysed (Lan *et al*., 2011). Some results have helped demonstrate that when temperatures in buildings are high, air quality tends to be poor, causing low mood, tension, and a low desire to work. Hight temperatures may also cause physical issues, as it is proved that “heart rate, respiratory ventilation, and end-tidal partial pressure of carbon dioxide increased significantly, and arterial oxygen saturation decreased” (Lan *et al*., pp 376, 2011). According to Roelofsen, there are two crucial thermal conditions in the building that must go hand in hand to achieve a good environment. The condition of the building itself and the conditions that the administration need to provide. The relationship between the two goes from the beginning of the construction of the building and how the organization of the interior is planned to achieve a more comfortable environment for employees. In Roelofsen’s study, various thermophysiological human models and simulation tools were used to evaluate the thermal conditions in workplaces. Thermophysiological human models are mathematical representations based on the thermal balance of the body, which means the exchange of heat that the body has inside with the temperature it faces in its environment (Roelofsen, 2002). These models can help researchers and engineers understand how the body regulates its temperature and responds to various thermal stressors.

Air quality

Pollution load on indoor air can cause dissatisfaction on people in the way they feel about the air quality (Wargocki, Wyon, Baik, Clausen, and Fanger, 1999). A study in Denmark implemented by Wargocki and Fanger, analysed the air conditions on ventilated offices with three different types of floor materials: felt carpet, linoleum, and polyolefin floor tiles (Wargocki *et al*., 1999). The air quality in rooms with these three

materials were tested by different groups of people and after one hour, the result was that the people working in the office whit the polyolefin floor tiles were less dissatisfied with the air conditions as the air was also with lower pollution levels (Wargocki *et al*., 1999). By examining the impact of air quality in ventilated offices, the study highlights how pollution levels can affect people's perception of the air they breathe. This critical analysis prompts a broader reflection on the design and management of indoor environments to prioritize air quality and ensure optimal conditions for occupants.

Another interesting study demonstrated that air quality has a significant positive or negative impact on the productivity of office employees' (Roelofsen, 2002). The experiment was carried out in a common office with good climate control in where was possible to produce two different air qualities, the first test was with normal air conditions and the second with a highest air quality. Both tests were kept at the same temperature for 4.5 hours. The result was that "6.5% more productivity was generated in employees' with better quality air and less rates of Sick Building Syndrome (SBS) (Roelofsen, pp. 250, 2002). The SBS symptoms includes headache, fatigue, and heaviness (Kang, *et al.,* 2017).

Indoor Air Quality (IAQ) is also affected by the type of ventilation that occurs in the physical space (Kang, *et al.,* 2017) as well as the number of furniture, electronic devices, and occupants. Studies have proven that SBS in offices can be reduced when there is greater ventilation with fresh air than with Artificial Air (AC), which also helps with occupant productivity. Fresh air also helps eliminate unpleasant odours, which have been shown to be a cause of lack of concentration and retention of information, but at the same time it has been proven that pleasant fragrances have not been a determining factor in increasing employee productivity either (Kang, *et al.,* 2017).

Lighting environment

Of the five IEQ factors, according to Roelofsen, the lighting factor has the least impact with respect to the productivity of individuals, unless the task to be performed requires a lot of visual impact like a designer or an architect whose tasks require a specific lightning. For people who work in standard office jobs such as administrative roles, whose tasks do not require special lighting conditions like creative or technical jobs do, it has been shown that the human eye is able to adapt to different stages of light

(Roelofsen, 2002), However according to Kang, lighting is a fundamental requirement in any office, and the quality of the lighting must be essential, since it helps influence the comfort and productivity of employees. There is great importance in having windows with natural light in offices, not only because of the good view they can provide but also because it helps reduce damage to vision and is not as harmful as the artificial light (Kang, *et al.,* 2017).

Acoustic environment

Lastly, acoustic environment. It is believed that this factor is one of the factors that has the greatest impact on employee productivity and job satisfaction. It is a fact that there is a greater presence of noise in open plan offices than in cell offices (Kang, *et al.,* 2017). It has been revealed that external noises generate less concentration, such as construction noises, conversations, noise from traffic, machines, phone ringing, keyboard sound, among others, generating a decrement in employees' performance. There is greater dissatisfaction and lower productivity in employees' who work in open-plan offices than in traditional offices (Jahncke, H., Hygge, S., Halin, N., Green, A. M., and Dimberg, K., 2011) and this is due to the noises that surround the office, as previously discussed. It is important to highlight that although noise is a cause of distraction and lower productivity in employees', it is also a cause of hearing impairment, causing problems with hearing health (Roelofsen, 2002).

If all these factors are considered by companies who provides offices for their employees,' is a greater opportunity to improve their own benefits. Most of the costs associated with maintaining a building come from employee salaries, benefits, utility bills and rent. Improving the Indoor Environmental Quality (IEQ) in the workplace could lead to economic benefits for the company by boosting productivity and promoting better health among employees' (Chinazzo, G., 2021). This could result in saving money and improving efficiency, for the company as employees' who are more productive tend to have a positive impact, on the organizations financial performance. The review of this literature underscores the impact of environmental elements, on individual performance and productivity in work settings. It stresses the significance of improving office designs, room temperatures, better air quality, lighting setups and sound conditions to boost employee health and effectiveness. Recognizing and dealing with these aspects are crucial for establishing settings that support efficiency

and general self-efficacy calling for interventions and policies based on evidence, for enhancement.

2.0.3 Outdoor and indoor environmental factors in housing conditions affecting self-performance and productivity of individuals.

The influence of outdoor environmental factors significantly affects people's capacity to perform tasks efficiently. This includes various elements, from natural factors like fresh air and sunlight to manufactured characteristics such as housing conditions, access to green spaces and individuals' sense of security in their neighbourhoods also play a crucial role. All these simple factors play a crucial role in shaping the cognitive functions of humans and overall productivity (Bjorndal, Ebrahimi, Lan, Nes, and Roysamb, 2023). Understanding how these factors influence the performance of individuals could possibly offer valuable insights to optimize work and living environments to improve well-being and productivity. It has been demonstrated that those individuals who have experienced extremely weather conditions or a direct impact of climate change on the places they live in, are more likely to be affected on their self-performance and productivity at their jobs and their daily tasks, affecting their quality of life (Crane, K., Li, L., Subramanian, P., Rovit, E. and Liu, J., 2022) .These weather phenomena can also bring traumatic events in individuals lives, including natural disasters. The indicators of a trauma reaction seem to correspond with the “indications of avoidance, guilt, rumination, hypervigilance and nightmares” (Crane, K., *et al*., 2022). Fires, floods, high and lower temperatures, hurricanes, all these phenomena are triggers on the lack of development in self-performance and productivity.

People's emotional wellbeing is substantially impacted by environmental pollution (Welsch, 2006). Based on a two-year study in which SO2 levels were monitored in 23 European countries asserted that air pollution can negatively impact individuals' wellbeing through physical health (Jianglin, K., Jizheng, Z. and Manhong, T. 2021). Moreover, environmental pollution can also alter people’s attitudes. A study in Iran demonstrated that the elevated temperatures, the air storms, and the air pollution present in the country, caused direct intentions on residents to immigrate due to the unfavourable weather conditions (Khavarian-Garmsir, *et al*., 2019), leaving to a

decrease in the population. Traffic noise exposure in cities is also a cause of different health problems like hearing problems, can develop a sleep disorder and could increase the levels of blood pressure (MacKerron and Mourato, 2013).

According to an article by EAI (Endorsed Transactions on Pervasive Health and Technology), in Europe, as consequence of the environmental changes, cases of depression and post traumatic disorders have increased significantly in areas with serious climate change or frequent natural disasters (Viehoff, Grossman, Huang, Jiang, and Zheng, 2022). In other words, the suicide rate has been related not only to the housing conditions, but also to environmental changes.

It has been found that symptoms of anxiety and depression can be caused by different environmental factors. A study have shown that the quality of housing and its conditions, are an important factor when it comes to the symptom of depression, which in the long term generates a deficiency in the productivity of the individual on their daily basis (Bjorndal, *et al*., 2023) and at the same time, external sounds, and noises, such as traffic, ambulances and even noisy neighbours, are generators of anxiety and depression. It has been revealed that having a green area near homes has reduced symptoms of depression, as spending time outdoors and in natural areas. Crime and living with the fear of experiencing crime is also associated with people's well-being and their personal development. According to Bjorndal (2023), well-being of people is also associated according to the society in which they live and their social perception, such as the acceptance they create towards their government, their politicians, and the laws they are impose to.

Research in environment behaviour and public health has delved into the relationship, between people and their surroundings drawing on human ecology theory (Amerio, A. *et al.*, 2020). In order to understand how health is linked to the built environment, it is essential to consider the physical characteristics of the building and peoples characteristics. According to Amerio, *et al.* (2020), since the 80’s, the aspects of built environment have been identified by socioecological theories as stress generators that were impacting the comfort and mental health along with individuals' performance. Old and deteriorated buildings, small spaces, poor ventilation, and humidity are factors that cause discomfort for people living in buildings with these conditions. Architects and urban planners can help by designing environments that are better for people,

creating better planned and healthier communities, which will help improve the quality of life in general. It is also important that housing developers are aware of the importance of green spaces, since having a green space close to where people live help to promote people's physical activity and therefore their health (Ward Thompson, C., 2013). It seems evident that these interactions between health and natural environment have an impact on people’s lives. Exposure to the natural environment helps to lower stress levels and improve concentration. These connections, referred to as biophilia, brought with it the idea that humans naturally feel emotionally connected to nature and all living beings, which has developed over time as humans have relied on the world for most of their existence (MacKerron and Mourato, 2013).

Expanding on the topic it is important to conclude that the link, between wellbeing and perceiving a community connection highlights how people find happiness and contentment when they sense strong bonds and support within their neighbourhoods. This is also known as social cohesion (Delhey and Dragolov, 2016). This feeling of unity includes trust, belonging and solidarity among community members, which can greatly boost happiness and wellbeing.

Moreover, being content with how democracy works and how the political systems operate speaks to the institutional aspects that impact personal wellbeing. If individuals believe that their opinions matter, that government is transparent and responsive to their needs and that they play a role in politics, this can foster a sense of empowerment and satisfaction. These positive experiences can then enhance their wellbeing. Recognizing these correlations emphasizes the significance of not only factors but also social, political, and environmental circumstances in promoting better living conditions for individuals as well, as communities.

2.1 Research question and objectives

Previous research has demonstrated that an individual's personal lifestyle is a significant determinant of their well-being and, consequently, their productivity as an employee. Those who are less satisfied with their indoor environmental quality (IEQ) tend to be less productive (Xingzhou *et al.,* 2023). For this reason, the aim of this study is to validate the findings by applying them to the context of foreign workers living in Ireland. The study seeks to demonstrate a positive correlation between the workplace environment and housing conditions with self-efficacy and performance.

Research question

The association between outdoor and indoor environmental factors affecting self-performance and productivity in foreign individuals living in Ireland.

Hypothesis

Hypothesis 1: A positive correlation will exist between the environmental factors in the workplace of individuals affecting their performance and productivity.

Hypothesis 2: A positive correlation will exist between housing conditions and living environment of individuals and their performance and productivity.

Hypothesis 3: A positive correlation will exist between age range and gender in the development of self-performance and productivity of individuals.

Chapter 3

3.0 Methodology

3.1 Methodology Introduction

This section aims to provide detailed information about the procedure picked by the researcher on the methodology of this research, adding to the justification of procedures. This section will present the methodology, research design, methodology employed for data collection, and data analysis applied in the research. This will provide insight into the execution and development of the research and techniques, and the tools utilised to address the research question and objectives of the study. This section is important as it also validates the credibility and reliability of the findings.

3.2 Research Philosophy

In order to extend the explanation of the research methodology, it is important to first understand the “research onion” created by Saunders, Lewis, and Thornhill (2019) in which each layer of the “onion” represents different options for data collection and data analysis.

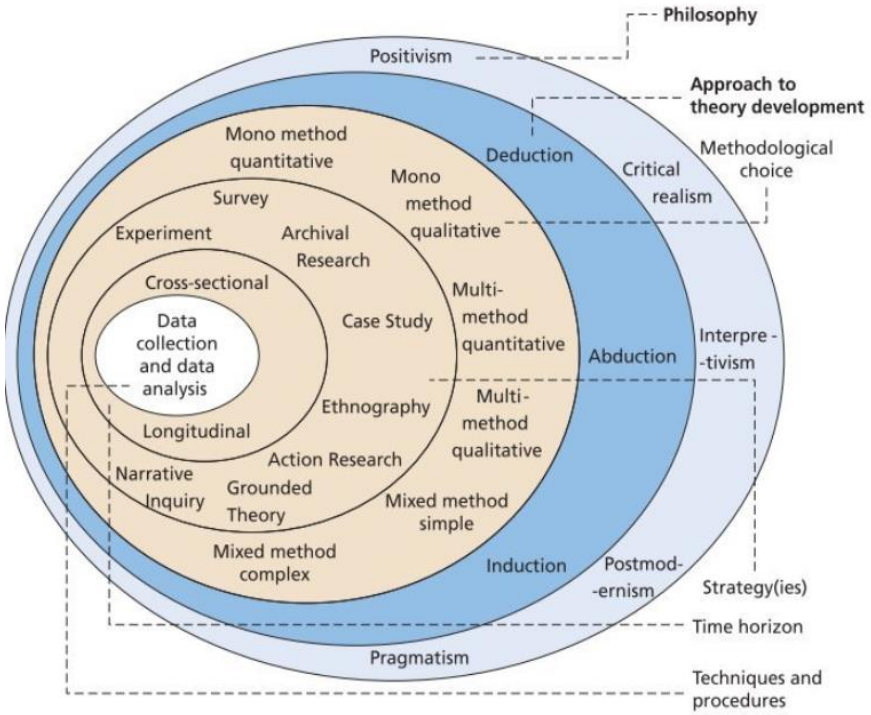


Figure 1: The Research Onion (Saunders, *et al.,* 2019)

The first layer of the onion is the research philosophy that refers to the beliefs and assumptions in the knowledge development (Saunders *et al,* 2019) identifying five research philosophies:

1) Positivism
2) Critical Realism
3) Interpretivism
4) Postmodernism
5) Pragmatism

Positivism follows one true reality, that can be measured from existing theory and after develops a hypothesis. (Saunders *et al,* 2019). Researchers following this approach look to find truths that already exist leaving behind the human perceptions. The way to find the truth is by hard evidence and numbers.

Critical realism explains that there is an external reality existing separately from human perception but the acknowledgements that already exist only come from social and cognitive processes. Interpretivism emphasizes the reality as something that we humans create from our surroundings and previous experiences, the way humans interpret individual and group experiences. The postmodernism perspective recognises the importance of language. It suggests that there is no true meaning in the world, and it rejects the objectivism. Lastly, the pragmatism depends on what is most useful for the situation, combining positivism and interpretivism (Saunders *et al,* 2019). It prioritizes the problem-solving addressing the research objectives effectively.

From these philosophies, the researcher opted to take the study with a positivism perspective, with the purpose of answering the research question and the objectives through empirical observation and scientific methods, in this case, a survey, where data will be provided and analysed.

This positivism method was chosen by also considering the three research assumptions: ontology, epistemology, and axiology.

Ontology assumes that there is an objective reality and existence. According to Saunders, *et al.* (2019, p.133) the ontology “determines how we see the world” and therefore, the ontological assumptions will shape the way of the study and the

research objectives. In the perspective of this study there is the acknowledgment that the environment affects the mental health of people.

Epistemology as a second research assumption is considered for this study which refers to what is valid, legitimate, and acceptable, according to Saunders, *et al.* (2019). The information presented in a legitimate way should be numerical, textual, or visual. As for this study, a quantitative method was chosen by the researcher where measurable data will be collected.

Axiological, the final assumption, refers to the beliefs of values and ethics in the research process. This is how the research bases the assumptions in ethical considerations, biases, and its own values. Saunders *et al.,* (2019) explained that researchers should base their judgments on personal beliefs but always consider the personal value position at the time of the conclusion. As for this study, the researcher considers the importance of the current environmental problems and how these affect people's lives on a daily basis, considering how they are affected by them which is why the topic was a motivation for the research.

The research onion, as outlined by Saunders *et al*. (2019), emphasises the importance of all aspects in the development of research. Using the research onion model, researchers adopt a methodical and well-informed approach to their studies. This model serves as a guide, ensuring ethical and coherent research conducted with a profound understanding of the context. This method helps researchers to ensure the relevance and applicability of their study of the investigated setting. Ultimately, the research onion aids researchers in navigating the complexities of the research journey, culminating in the generation of valuable and influential findings. In the current study, by applying the positivism perspective and these three research assumptions in relation to this study combined with the quantitative methodology, this will bring the researcher the possibility of identifying the reality from the information obtained combined with the researcher's ideologies and opinions and further develop the hypotheses where the scientific method will be proven.

The purpose of the scientific method is to analyse the effect on the variables, considering the dependent variable (self-efficacy) and independent variables (housing conditions, work environment and demographics).

3.3 Research approach

For the research approach, Saunders *et al*. (2019) mention three main approaches in the development of theory, each providing different perspectives on how theories are generated and validated. These approaches are deductive, inductive, and abductive.

The deductive approach begins with a general theory or hypothesis and then tests it through empirical observation and data collection (Saunders *et al.,* 2019). Researchers using this approach begin by formulating a hypothesis based on theories or conceptual frameworks. After this, they carry out a study design to verify these hypotheses, and this verification is carried out by gathering data to confirm or reject the hypothesis. If the data supports the hypothesis, it means that there is evidence and support for that theory, otherwise, if the data does not support it, the theory is rejected (Saunders *et al.,* 2019).

The inductive approach comprises theories generated from a specific observation or pattern that was identified in the data (Saunders *et al.,* 2019). Researchers using this approach start with empirical observations and then develop broader theories or conceptual frameworks. They analyse the data to identify recurring patterns and with these results they develop new theories or redefine existing ones (Saunders *et al.,* 2019). These theories developed with an inductive approach are based on empirical evidence and can emerge gradually through the iterative process of data collection and analysis.

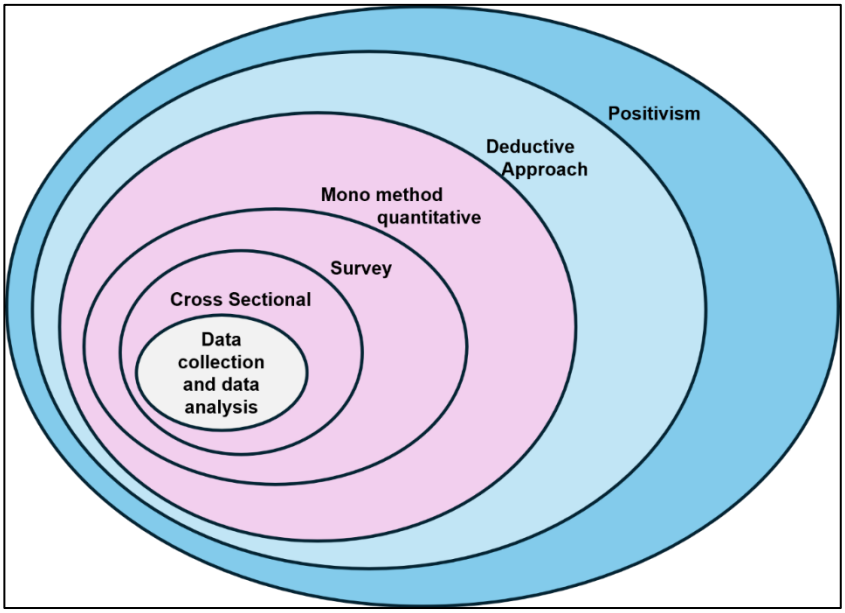
Lastly, the abductive approach combines elements of deduction and induction, focusing on assumption and reasoning to generate and refine theories. Researchers using this approach start with observations or data that may not fit existing theories or explanations (Saunders *et al,* 2019). They then use creative reasoning and inference to develop plausible explanations or hypotheses that can explain the observed phenomena. This approach is particularly useful as it allows researchers to use different research philosophies. That said, this study bases its research approach on the deductive one, since the method is based on an existing theory. This helped the researcher to generate new ideas to create hypotheses that were tested using data creating a conclusion in whether the data was true or false.

In this study, the researcher used information from existing literature to form their hypothesis and then gathered data using an online survey with trusted questions that have been used before from validated literature. Valid scales were used to measure the effect generated by people's housing conditions and workplace environment with the effect of the self-efficacy on each individual. Then after a quantitative method was chosen to analyse all the outcome from the survey results and the correlation between the data and the hypothesis.

3.4 Research design

The following picture explains the research onion that was used in this study and the choices that were made to collect the data and the analysis procedures, taking into consideration Saunders' research onion (Saunders *et al.,* 2019).

Figure 2: The Research Onion for this study
Source: own elaboration



All stages of the research onion were chosen coherently in order to be able to answer the research question and the subobjectives established in this study. A cross-sectional approach was chosen to measure the independent variables DE (demographics), HC (housing conditions) and WPE (workplace environment) against the dependent variable SE (self-efficacy). Different participants of various ages were chosen at one point in time to determine if there exist age-related differences in the analysis; also, gender and nationality were considered to see the impact of these on

the answers. All data from each variable were quantitatively measured and subjected to statistical analysis following their collection.

3.5 Data collection

Primary data was used for the data collection where the method consisted of a questionnaire survey where 70 participants were considered, composed of 31 females (44.3%) and 39 males (55.7%). All the participants were specifically chosen, as they all fall within the same specific niche of this study, including living in Ireland, having an office job and being foreigners. The survey was elaborated using the Google Forms tool where the researcher was allowed to adapt and present the questionnaire in the easiest way possible for the participants' understanding. Once the questionnaire was finished, this one was sent to the supervisor of this study for its approval. The participants received the invitation to participate in the survey via email, and online messages, by clicking on the link they could easily have access to the whole questionnaire. Consent was previously asked to the participants before starting the survey.

Since applying this method, the researcher was able to collect more data in less time and the participants could answer easily using only their phones. It was measured that the survey took around two and three minutes to be completed by each participant. The researcher started to collect the primary data with the survey method, which helped to establish a base for the analysis and subsequently, interpret the study results. Furthermpleore, this method facilitated informed decision-making by the researcher and enabled the drawing of significant conclusions derived from the gathered data.

Different methods were used to measure the variables to be studied in the current study. The questionnaire was divided in four sections according to the objectives: Section 1 collected demographic information about the participants; Section 2 collected data about how the participants were feeling about the five key IEQ aspects at their workplace; Section 3 collected the housing conditions and data about how the participants feel about their life conditions; and in Section 4 the data collected was a General Self-Efficacy questionnaire.

For the dependent variable, which is about how foreign individuals feel about their self-performance and productivity, a General Self-Efficacy Scale (GSES) was utilized. This questionnaire consisted of eight simple questions (items) in which the ability of each individual to believe in themselves is detected when a difficult situation arises and how they cope to get out of that obstacle (Jerusalem and Schwarzer, 1992). The answers were rated by four choices in the following scale:

- Not at all true (Score: 1)
- Somewhat true (Score: 2)
- Mostly true (Score: 3)
- Exactly true (Score: 4)

The scores of each question were summed to give a total score.

For the independent variables, two different questionnaires were used. For the workplace environment variable, the questionnaire used was: “The impact of indoor environmental quality on work productivity” by Shengxian Kang, Dayi Ou and Cheuk Ming Mak (2017). In this questionnaire it can be analysed how the productivity of each individual could be impacted by different factors in their workplace. These factors were divided into five aspects - layout of the office, air quality, thermal conditions, lighting, and acoustics (Kang *et al*., 2017). The questionnaire consisted of eleven questions (items) that were answered with five choices in the following scale:

- Very Dissatisfied (Score: 1)
- Dissatisfied (Score: 2)
- Neutral (Score: 3)
- Satisfied (Score: 4)
- Very Satisfied (Score: 5)

To measure the influence of housing conditions on the self-performance and productivity, the questionnaire used was: “mental health and environmental factors in adults: a population-based network analysis’ by Bjorndal *et al*., 2023). The intention of this questionnaire is to find if there is a relationship between whether the environmental factors and housing conditions have any influence on people with respect to their well-being and if these factors affect their work performance. The questionnaire consisted of nine questions (items), where five of the questions were answered by “yes or no”, and the remaining four were measured by the following scale:

- Extremely negative (Score: 1)
- Somewhat negative (Score: 2)
- Neutral (Score: 3)
- Somewhat positive (Score: 4)
- Extremely positive (Score: 5)

Lastly for the measure of the demographics data, a Quality-of-Life Survey (QoL) was conducted provided by the same questionnaire of “mental health and environmental factors in adults: a population-based network analysis’ by Bjorndal *et al*, (2023), where a replication sample was used in this study. In this section, five questions were asked including gender, age group, current urban setting, nationality, and time living in Ireland (Bjorndal *et al.*, 2023).

3.6 Data analysis

Data analysis constitutes a systematic scientific methodology directed towards analysing and interpreting data to determine meaningful results. Through the utilization of diverse tools and techniques, researchers can delve deeply into collected data, identifying trends, patterns, and relationships, irrespective of whether the data is quantitative or qualitative (Rumsey *et al*., 2022). The more frequent types of data analysis are predictive, prescriptive, descriptive, and diagnostic analysis. Most researchers analyse data in different sets of tools such as Microsoft Excel, Python, SPSS, and Metabases. This strategic approach facilitates the development of data findings, reinforcing important aspects of the research study and facilitating the extraction of significant insights. Throughout this study, a sequential and systematic methodology has been adhered to. Quantitative data analysis techniques were employed to address research objectives, enabling informed decision-making based on numerical data. This analytical approach strengthens the research findings and contributes to a well-rounded, structured conclusion.

The gathered data was coded using Microsoft Excel and SPSS. The analysis commences with demographic information collected from respondents, followed by descriptive statistical analysis comparing variables, elucidated through mean and standard deviation. A reliability test was conducted to affirm the validity of the applied

measures, alongside Pearson correlation and regression analyses to determine the impact of self-performance and work productivity as a dependent variable on housing conditions and environmental factors as independent variables. These findings may evaluate the relation between how the individual surroundings at their workplace and house conditions can influence the individual daily self-performance. The researcher opted for these analytical tools due to their reliance on numerical data, thus mitigating potential researcher bias.

3.7 Sample size

The size of the sample plays an important role in research, directly influencing the reliability and applicability of the study's results (Snyder, 2019). A sample of 70 participants from different countries that were currently living in Ireland for more than six months and currently working were chosen to respond to the research inquiries. Choosing this sample size was very important because how well the analysis carries out most likely depends on how many people take part.

Limitations: For the sample size, the number of respondents is considered a small sample size, since the pre-validated questionnaires had a bigger number of respondents, but due to the lack of time, the researcher was not able to collect more responses which resulted in a non-generalize sample.

3.8 Ethical considerations

During the research analysis phase, ethical considerations assume a significant role in the decision-making process. These considerations act as a guiding framework for individuals and organizations, determining moral correctness according to the situation and what is acceptable for those involved (Tripathi and Chaturvedi, 2023). Classified into four principal elements: autonomy, beneficence, non-maleficence, and justice, these considerations are pivotal in ensuring ethical integrity throughout the research journey. When researchers prioritize following these guidelines, they guarantee that data is gathered from sources thus upholding the highest level of integrity. Adhering to research ethics helps maintain professionalism and relevance enhancing the credibility of the study.

The researcher placed considerable emphasis on preserving data confidentiality during the survey phase. This approach is vital for maintaining ethical integrity, aligning with moral principles governing data management. Participants were provided with information regarding the study's purpose before consenting to participate, with explicit consent required at the survey's commencement. No personally identifying information was collected, and participants retained the freedom to decline participation without consequence. Upon completion of the dissertation, all data will be securely deleted.

Chapter 4

4.0 Analysis and findings

The primary objective of this study is to evaluate the analysis and conclusions derived from the data collection. Initially, the information gathered from Google Forms was transcribed into an Excel spreadsheet to facilitate the codification of responses, enabling the subsequent exportation of data into SPSS. The survey started with the demographic data obtained from respondents, followed by the data from the independent variables (specific indoor environmental factors and housing conditions that have been shown to affect self-performance and productivity). Lastly, the data considered for the dependent variable (Self-Efficacy) was taken into account.

4.1 Demographics results

Regarding the demographics section, the participants were asked about their gender, age group, current urban setting, nationality, and time living in Ireland, These first questions were essential for the analysis on this study since it was important to gather the answers from the correct audience, in this case it was important to know if the interviewees were foreigners and if they had been living in Ireland for more than 6 months. The results showed that the majority of the participants were males with 39 answers (55.7%) while for the females, answers gather were 31 (44.3%) (see Table 1). For the age group, the majority of the participants were between 25 to 34 years old, with 48 respondents (68.6%) (see Table 2). Regarding the nationality, the survey got answers from participants from 17 different countries, none of them including Irish

natives. The majority of answers were from respondents from Mexico with 34.3% followed by India with 22.9% and on third place Italy with 11.4% (see Table 3). For the time living in Ireland, the survey showed that the 44.3% of the participants have been in Ireland between 1 and 3 years, and 16 of the respondents (22.8%) (see Table 4) have lived there more than 3 years. Lastly, for the urban setting area question, the majority of respondents are currently living in urban areas with 92.9%, while the rest live in the county side (see Table 5).

4.2 Descriptive Statistics

The descriptive statistics will help the researcher to provide a summary of the main characteristics of the data including the mean which is the average of the data and standard deviation which is the measure of the dispersion of the data around the mean (Terrell, 2021). These two are important to understand the characteristics of the data and make statistical inferences.

In this case is the summary of the dependent variable (self-efficacy) and the independent variables (workplace environment and housing conditions). In the descriptive statistics (see Table 6), the table contains an average mean of 24.21 and a standard deviation of 4.53 in the self-efficacy; then workplace environment has an average mean of 21.28 and a standard deviation of 4.70, and housing conditions is with an average mean of 16.60 and a standard deviation of 3.13. The total number of answers in the survey and these descriptive statistics were analysed combined to have an overall idea of each hypothesis.

Table 6. Descriptive Statistics

Descriptive Statistics

	N	Mean	Std. Deviation
SelfEfficacy	70	24.2143	4.53614
WorkPlaceEnv	70	21.2857	4.70012
HousingConditions	70	16.6000	3.13651
Valid N (listwise)	70		

4.3 Self-Efficacy statistics (dependent variable)

In order to measure the self-performance and productivity on individuals a General Self-Efficacy Scale (GSES) was utilized. The questions in the survey emphasize general beliefs in the abilities of each individual on how to respond and deal with spontaneous situations and obstacles. The answers were stablished in a scale frequency from 1 to 4 in where: not at all true = 1, somewhat true = 2, mostly true = 3 and exactly true = 4. The scores of each of the eight items were summed to dive a total score. According with Jerusalem and Schwarzer (1992), the score displayed on the scale represents the strength of an individuals generalized self-efficacy belief. The higher the score, the biggest is the sense of self-efficacy.

Table 7. Self-Efficacy statistics

Item	Questions	Not at all true		Somewhat true		Mostly true		Exactly true		Grand Total	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Mean	SD
1	I can always manage to solve difficult problems if I try hard enough.	4	5.7%	5	7.1%	35	50.0%	26	37.1%	3.18	0.80
2	If someone opposes me, I can find the means and ways to get what I want.	3	4.3%	22	31.4%	36	51.4%	9	12.9%	2.72	0.74
3	It is easy for me to stick to my aims and accomplish my goals.	5	7.1%	15	21.4%	42	60.0%	8	11.4%	2.75	0.75
4	I am confident that I could deal efficiently with unexpected events.	4	5.7%	7	10.0%	43	61.4%	16	22.9%	3.01	0.75
5	I can solve most problems if I invest the necessary effort.	2	2.9%	5	7.1%	32	45.7%	31	44.3%	3.31	0.73
6	When I am confronted with a problem, I can usually find several solutions.	3	4.3%	8	11.4%	46	65.7%	13	18.6%	2.98	0.69
7	If I am in trouble, I can usually think of a solution.	4	5.7%	6	8.6%	37	52.9%	23	32.9%	3.12	0.79
8	I can usually handle whatever comes my way	4	5.7%	7	10.0%	37	52.9%	22	31.4%	3.10	0.80
	Average	**5.2%**		**13.4%**		**55.0%**		**26.4%**		**3.02**	**0.76**

The results of the analysis suggest that many respondents showed a positive attitude towards problem-solving and were confident in their decision-making abilities. The frequencies with the most recorded answers were “mostly true” with a mean of 55% and “exactly true” with a mean of 26.4%. Having as an overall result a mean of 3.02 and a standard deviation of 0.76. Overall, this suggests, and is consistent with the literature, that most participants tend to have a positive perception of problem solving and a positive perception of believing in their own decisions.

4.4 Workplace environment statistics (independent variable)

For this first independent variable, the questionnaire used was: “the impact of indoor environmental quality on work productivity” by Shengxian, *et al*., (2017). This test analysed different environmental factors that office workers face and that impact their performance and productivity. The questions were divided in different aspects of the IEQ and then by subfactors. These key aspects are layout of the office, air quality, thermal conditions, lightning and acoustic of the environment. Items 1 and 2 belong to the layout aspect, items 2 and 3 belong to the air quality aspect, items 5 and 6 belong to the lightning environment aspect and items 7 and 8 belong to the thermal environment aspect. The answers for these items were stablished in a scale frequency of 1 to 5 in where: very dissatisfied = 1, dissatisfied = 2, neutral = 3, satisfied = 4 and very satisfied = 5. The overall result was a mean of 3.23 and a standard deviation of 1.00 (see Table 8). It is important to emphasize that these 8 items were measure in a scale frequency, items 9 and 10 were measure in binary frequency and item 11 was not analyse in any of the analysis since it was only a question to support item 10 and to support literature (see Table 11).

Table 8. Workplace environment statistics

Item	Questions	Very dissatisfied		Dissatisfied		Neutral		Satisfied		Very Satisfied		Grand Total	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Mean	SD
1	How do you feel about the equipment at your workplace?	4	5.7%	7	10.0%	26	37.1%	24	34.3%	9	12.9%	3.38	1.02
2	How do you feel about the personal space at your workplace?	7	10.0%	4	5.7%	28	40.0%	27	38.6%	4	5.7%	3.24	1.01
3	How satisfied are you with the ventilation at your workplace?	9	12.9%	8	11.4%	19	27.1%	25	35.7%	9	12.9%	3.24	1.20
4	How satisfied are you with the air freshness at your workplace?	7	10.0%	7	10.0%	26	37.1%	21	30.0%	9	12.9%	3.25	1.12
5	How satisfied are you with the artificial lightning at your workplace?	5	7.1%	5	7.1%	26	37.1%	25	35.7%	9	12.9%	3.40	1.04
6	How satisfied are you with the natural lightning at your workplace?	6	8.6%	16	22.9%	20	28.6%	14	20.0%	13	18.6%	3.17	1.23
7	How do you feel about the temperature at your workplace?	2	2.9%	13	18.6%	39	55.7%	13	18.6%	3	4.3%	3.02	0.81
8	How do you feel about the humidity at your workplace?	1	1.4%	5	7.1%	50	71.4%	13	18.6%	1	1.4%	3.11	0.60
		Door seat		**Window seat**		**Neither (NWND)**					**Average**	**3.23**	**1.00**
9	What is your seat position at the place you work at?	10	14.3%	22	31.4%	38	54.3%						
		Noise sources		**Quietness**									
10	How is the acoustic environment at the place you at?	43	61.4%	27	38.6%								
11	Noise sources that get people more distracted at work	See Table 11											

4.5 Housing conditions statistics (independent variable)

For the second independent variable, the questionnaire used was: “mental health and environmental factors in adults: a population-based network analysis” by Bjorndal, *et al*., (2017). This test analysed the impact of housing conditions on the performance and productivity of individuals. The answers for items 1, 2, 3 and 4 were stablished in a scale frequency of 1 to 5 in where: extremely negative= 1, somewhat negative = 2, neutral = 3, somewhat positive = 4 and extremely positive = 5. The overall result was a mean of 3.23 and a standard deviation of 1.00 (see Table 9). Items 5, 6, 7, 8 and 9 correspond to a binary frequency that could not be analysed with standard deviation according to its nature but where helpful in this study to support literature.

Table 9. Housing conditions statistics

Item	Questions	Extremely negative		Somewhat negative		Neutral		Somewhat positive		Extremely positive		Grand Total	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Mean	SD
1	How satisfied you feel with the area/village/district you live in?	2	2.9%	5	7.1%	14	20.0%	30	42.9%	19	27.1%	3.84	1.00
2	How satisfied are you with your housing?	5	7.1%	6	8.6%	19	27.1%	24	34.3%	16	22.9%	3.57	1.14
3	Do you feel that you belong to the residential area you live in?	3	4.3%	9	12.9%	20	28.6%	24	34.3%	14	20.0%	3.52	1.08
4	Do you feel safe when walking out in the local environment?	5	7.1%	7	10.0%	17	24.3%	24	34.3%	17	24.3%	3.58	1.17
		No		Yes							Average	3.63	1.10
5	Do you face problems with noise at home?	48	68.6%	22	31.4%								
6	Do you face problems with dust, smell, or contamination at home?	48	68.6%	22	31.4%								
7	Is there an area for play and recreation within 200m of your home?	24	34.3%	46	65.7%								
8	Do you face problems with crime, violence, or vandalism in residential area you live in?	48	68.6%	22	31.4%								
		Not worried		Very worried									
9	Do you feel worried about violence or threats when walking outside and alone?	37	52.9%	33	47.1%								

4.6 Reliability Analysis

As suggested in previous literature, the data collected from the questionnaire was tested by using Cronbach's alpha coefficient to review its reliability and consistency. According to Shengxian, *et al* (2017), the recommended Cronbach's alpha value must be above 0.6, which it can be considered as a good reliability. The questions were compounded in sections and each section was tested separately to run the reliability test.

As shown in table 10, the Cronbach's alpha calculated in workplace environment was 0.670, housing conditions was 0.788 and self-efficacy was 0.886, which shows that according to the results, the questions in the survey have sufficient reliability. The reliability mean of these 3 sections was of 0.781.

Table 10. Reliability analysis of variables

Sections	Variables	Cronbach's Alpha	N of Items considered	N of Items excluded
2	Workplace Environment	0.670	8	3
3	Housing Conditions	0.788	4	5
4	Self-Efficacy	0.886	8	0
	Mean	**0.781**		

4.7 Limitations

When conducting analyses using SPSS it is important to consider how is the interaction between the variables with different measurement scales. In this study the researcher investigated how workplace and life conditions impact individuals' performance and self-efficacy. It became clear that separating variables based on their measurement scales was necessary in both sections of the study. For example, when analysing the housing conditions questionnaire, it was noted that four of the questions were based on scale responses while the remaining five were binary responses (yes/no).

After conducting research and consulting with the study supervisor it was evident that mixing these variables without consideration for their measurement scales could affect the analysis. For instance, procedures like regression analysis require all variables to

be on the scale measure, for valid results. The reliability analysis focused solely on scale responses to maintain the integrity and validity of the findings. Neglecting to account for measurement scales when combining scale and binary variables could have led to inaccurate conclusions and interpretations.

The limitations to analyse the variables of section 2 (workplace environment), were question 9, 10 and 11 (see Table 8). These questions were not part of the scale measurement but were considered also for the analysis as secondary data. The limitations to analyse the variables and section 3 (housing conditions) were questions 5, 6, 7 8 and 9 (see Table 9). These questions were considered as binary variables and could not be mixed with the scale variables but were considered for the data analysis as secondary data. Lastly, for section 4 (Self-efficacy) all questions were considered as all of them were scale variables (see Table 7).

4.8 Correlation Analysis

In this study the correlation analysis was used as a method to investigate how variables, in this research framework are related. Correlation analysis plays a role in studies by helping to understand the connections and trends among the variables being studied (Lambert, 2017). Essentially, correlation analysis measures the strength and direction of relationships between two or more variables offering insights into how different phenomena interconnected. By assessing these relationships intensity and direction researchers can determine if changes in one coincide with changes, in another. In a statistical perspective, according to Professor Lambert, (2017) the Pearson correlation coefficient is a numerical value that ranges from -1 to + 1, the closest to zero represents less correlation, the closer it is to +1 represents more evidence of a positive correlation, and to reject or approve the hypothesis the significance of the test (2-tailed) the correlation need to have a result between 0.05 and 0.01. The correlation analysis was tested between the dependent and the independents variables using Pearson correlation coefficient analysis. The first analysis to test first hypothesis, was between self-efficacy (dependent variable) and workplace environment (independent variable) (see Graph 1). The results demonstrated in the graphical representation that there is a pronounced slope

between the variables which means that exist an association between self-efficacy and workplace environment. The Pearson correlation between these two variables was of .227 with a 2-tailed sig of .059 (see Table 12), giving a moderate positive correlation that supported the hypothesis.

Graph 1. Correlation between SE and WPE

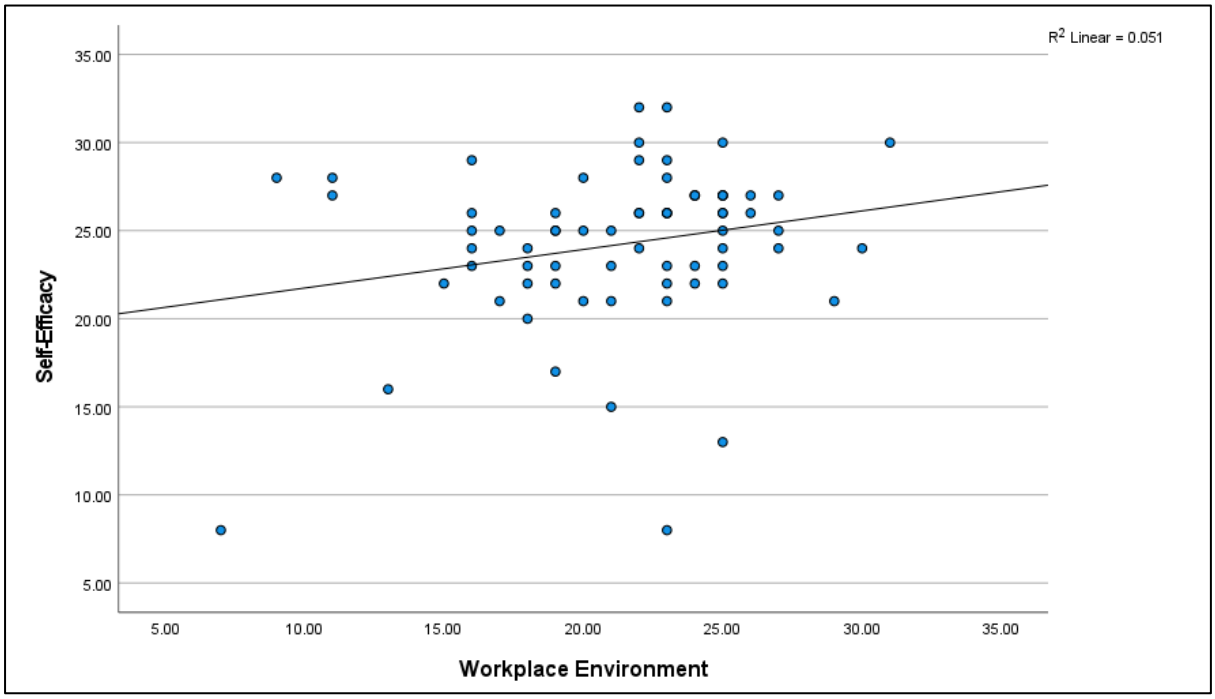


Table 12. Pearson correlation between SE and WPE

Correlations

		SelfEfficacy	WorkPlaceEnvironment
SelfEfficacy	Pearson Correlation	1	.227
	Sig. (2-tailed)		.059
	N	70	70
WorkPlaceEnv	Pearson Correlation	.227	1
	Sig. (2-tailed)	.059	
	N	70	70

For the second hypothesis, correlation analysis was also tested between self-efficacy (dependent variable) and housing conditions (independent variable) (see Graph 2). The results indicated that the Pearson correlation between these two variables was of .433 with a 2-tailed sig of .001 (see Table 13). These results are meaningful since the

correlation is statistically significant, which is unlikely to have occurred by random chance giving a supported hypothesis.

Graph 2. Correlation between SE and HC

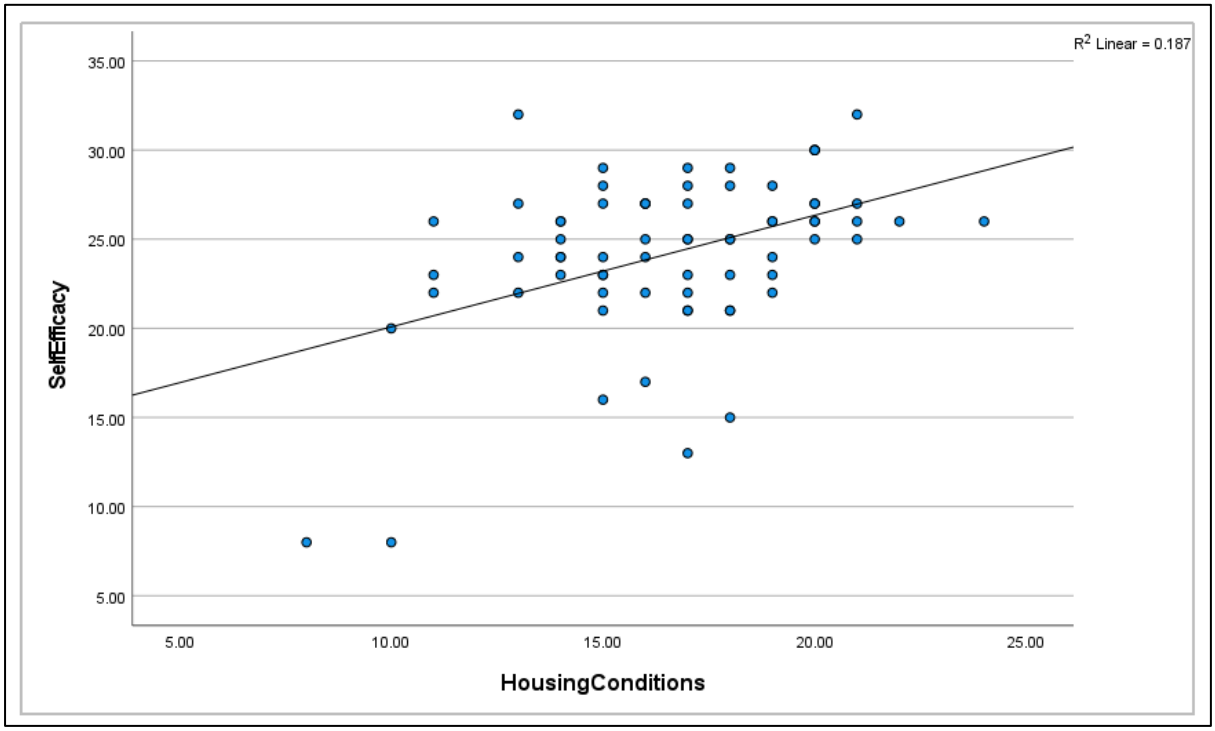


Table 13. Pearson correlation between SE and HC

Correlations

		SelfEfficacy	Housing Conditions
SelfEfficacy	Pearson Correlation	1	.433**
	Sig. (2-tailed)		<.001
	N	70	70
HousingConditions	Pearson Correlation	.433**	1
	Sig. (2-tailed)	<.001	
	N	70	70

**. Correlation is significant at the 0.01 level (2-tailed).

4.9 Regression Analysis

In this study, regression analysis was used as a method that helped the researcher to examine the connections, between the variables and forecast outcomes. Regression analysis plays a role in research by enabling researchers to indicate how one or more independent variables affect a dependent variable (Terrell, 2021). Within this study regression analysis is employed to address the research inquiries and hypotheses by assessing how numerous factors can predict the desired outcome.

For the regression analysis, a multilinear regression model was used as the analysis was based on one single dependent variable and two independent variables. The findings in this analysis according to the standardized coefficients indicated that workplace environment will lead to .122 (12.2%) with a significance of .279 (see Table 14), this means that for every unit increase in the quality of the workplace environment, self-efficacy is expected to increase by 12.2%. However, this relationship was not statistically significance (sig = .279), meaning it could have occurred by chance. For the housing conditions the standardized coefficients was of .407 (40.7%) with a significant of .001 (see Table 14). These results showed that for every unit improvement in housing conditions, self-efficacy is more likely to increase by a substantial 40.7%. This relationship was statistically significant (sig = .001), suggesting it is unlikely to be due to coincidence. This result is in line with the literature review, in fact according to Bjorndal, the higher well-being and self-efficacy perceived in people is positively associated with housing conditions satisfaction (Bjorndal *et al.,* 2023).

Table 14. Regression analysis between variables

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	11.261	3.551		3.171	.002
	HousingCond3	.589	.161	.407	3.651	<.001
	WorkPlaceEnv3	.116	.106	.122	1.091	.279

a. Dependent Variable: SelfEfficacy

The model itself indicated a R Square of .202 (see Table 15), which represents 20.2% of the effect on Self-Efficacy. Overall, the model suggests that workplace environment and housing conditions together account 20.2% of the variation in self-efficacy levels.

Table 15. Model summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.449[a]	.202	.178	4.11322

a. Predictors: (Constant), WorkPlaceEnv3, HousingCond3

Reporting a multiple-linear regression in APA

Exploring how different factors relate to an outcome is a part of empirical studies. The aim, in this research was to analyse how various independent variables can predict a variable using multiple linear regression analysis**,** the explanation in APA form was based on the presentation of Plummer, K (2014).

A multiple linear regression was calculated to predict self-efficacy based on housing / workplace environment. A significant regression equation was found (F (2,67) = 8.459, p < 0.01), with an R2 of .202. Participants predicted self-efficacy in equal to 11.261 + .589 (housing conditions) + .116 (workplace environment) where housing conditions are measured with the perception of individuals on its dwelling and work environment is measured from indoor environmental quality at the workplaces. Participants predicted self-efficacy increased .589 based on their work environment and .116 in their perception of housing conditions. Both workplace environment and housing conditions were significant predictors of self-efficacy.

Chapter 5

5.0 Findings and results

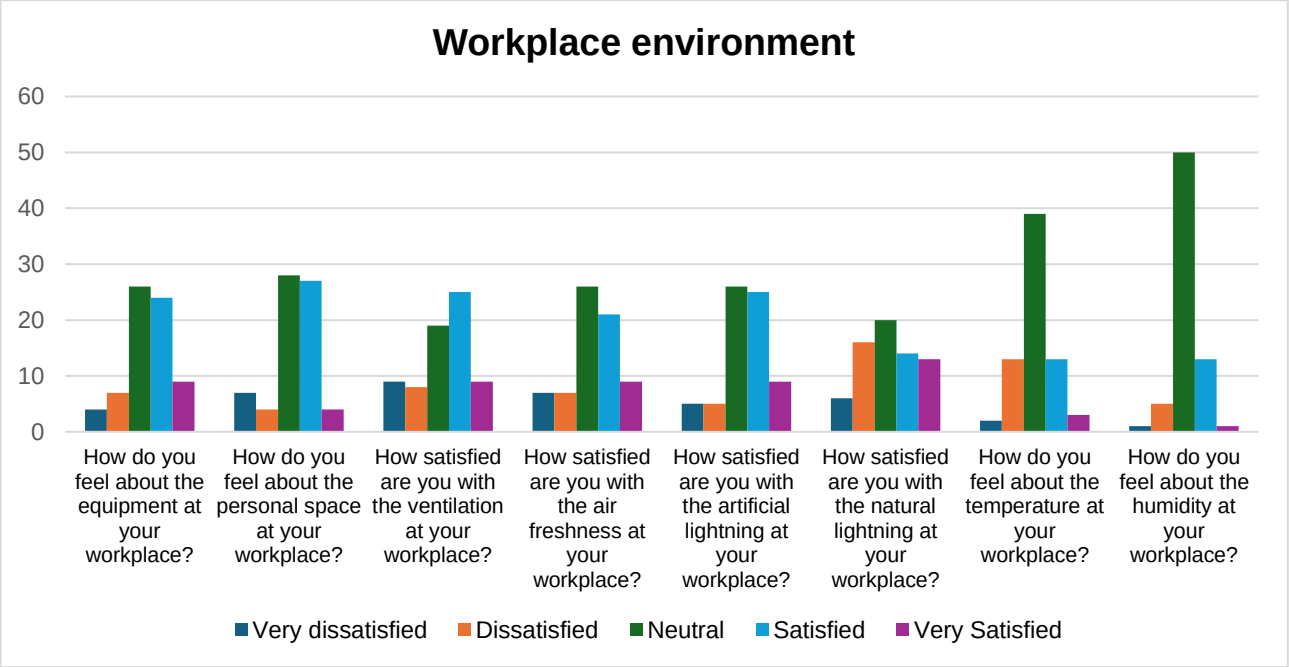
5.1 Hypothesis 1

The aim of this first hypothesis was to explore how the environment at work could impact how well individuals perform and their productivity. This idea comes from studies indicating that the physical layout and social atmosphere at work can significantly shape employees' job results (Shengxian, *et al*., 2017). Work settings involve a variety of elements, such as the office layout, noise levels, lighting, temperature, and air conditions. These elements can impede employees' in carrying out their duties effectively and productively.

This study employed research data and statistical analysis to examine the null or positive hypothesis regarding the impact of these factors on individual performance and productivity. The statistical analysis applied included descriptive statistics, reliability analysis, correlation analysis and regression analysis.

After running the analysis, the results for the hypothesis 1 was supported, indicating a positive hypothesis. It is mathematically approved that in practical terms there are indications that a positive work atmosphere is linked to increased self-efficacy and productivity on individuals. Additional studies, with a large group of participants might be suggested to validate the importance of this connection.

Figure 3. WPE database analysis



Overall results: Analysing the data provided by the participants on the survey on employee satisfaction aspects of their workplace environment (see Figure 3), the researcher concludes with the following statements. Most of the respondents seems to be either neutral or satisfied with all the aspects of their WPE, as indicated by having the most answers in “Neutral”, “Satisfied” and “Very Satisfied”. The highest satisfaction levels were observed in the “Satisfied” category for equipment, personal space, and ventilation, suggesting that employees are satisfied with these three factors among the others. As area for improvement, the data indicates a notable proportion of respondents expressing dissatisfaction or neutrality regarding natural lighting, suggesting that improvements in this area may raise overall employee satisfaction. While most respondents are neutral about temperature and humidity, there is a considerable number expressing dissatisfaction, particularly in the "Dissatisfied" category. This indicates potential areas for adjustment to create a more comfortable working environment. Analysing these scale answers, researcher was allowed to see that there is a consistent pattern of responses, with similar distributions across the satisfaction categories. This suggests a certain level of coherence in employee perceptions of their workplace environment.

The following charts contain insights about two other aspects of the workplace environment: seat position and acoustic environment.

Figure 4. WPE database analysis (seat position)

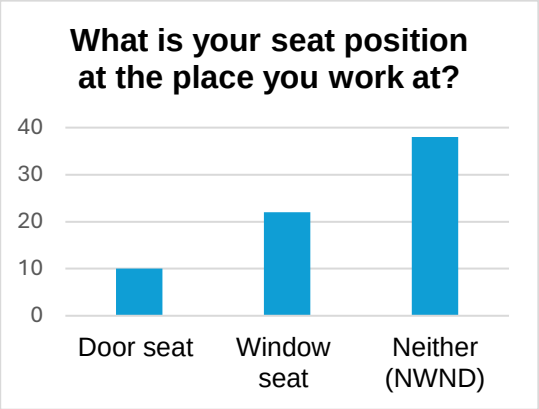
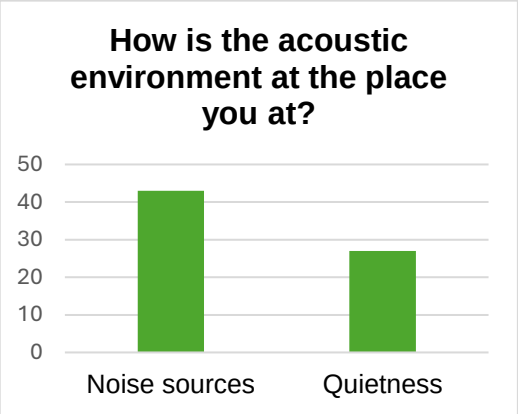


Figure 5. WPE database analysis (acoustic)



The data shows a higher number of respondents occupying seats away from both doors and windows (NWND) compared to those near doors or windows. In the literature it was mentioned that there is more job satisfaction on people who have their desk located near the window or door in the office, but at the same time they find it more difficult to concentrate due to external noise. In this case, the data from the survey confirmed that people who are located NWND are also exposed to different sources of noise. Most respondents (43 out of 70) reported the presence of noise sources in their workplace environment (see Figure 5). This suggests that noise may be a common problem, potentially affecting productivity, and concentration levels, regardless of where the desk is located. Companies may consider employee preferences or handle any concerns related to seating arrangements to improve employee comfort and satisfaction. The noise sources that happened to get people distracted at work are showed in Table 11, only for literature matters.

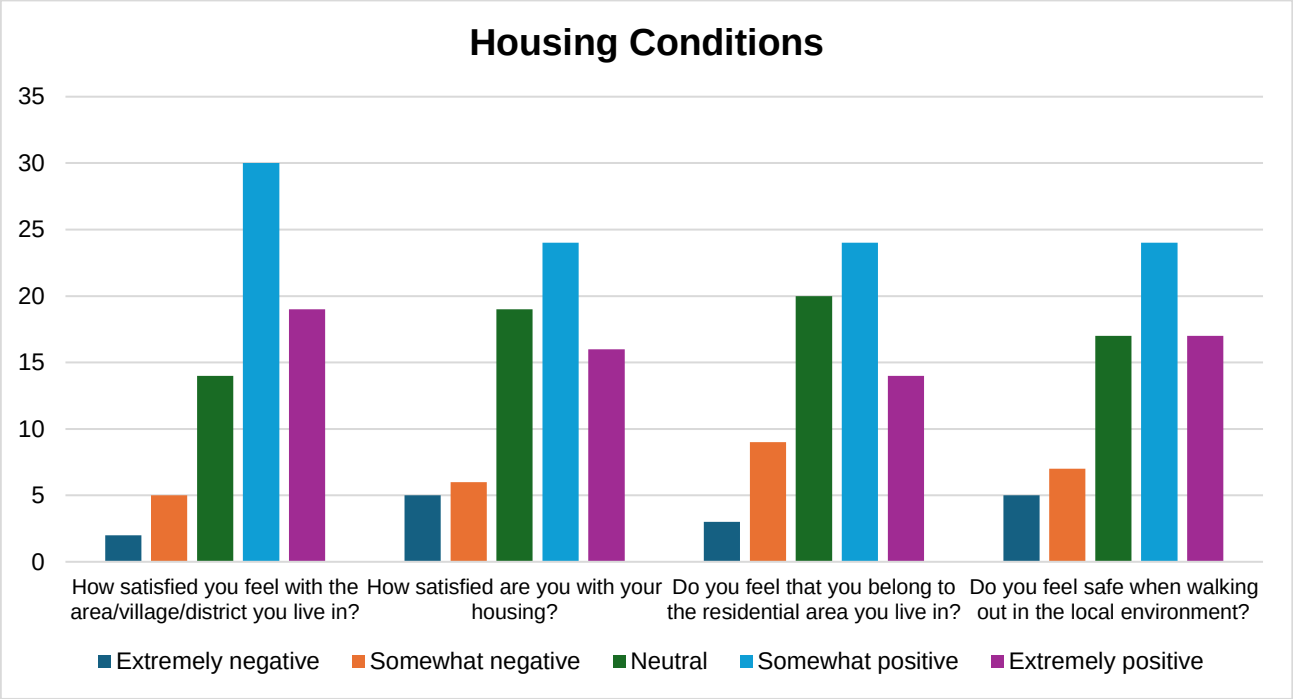
5.2 Hypothesis 2

The second hypothesis under investigation in this study focused on the idea that hosing conditions and the living environment can affect how well people perform and how productive they are. This hypothesis comes from understanding that housing and living situations have an important role and an influence on people's lives, including their well-being and productivity (Bjorndal, *et al*., 2023). Housing conditions include aspects like the quality of housing, cleanliness, the noise levels. The overall living

environment includes factors such neighbourhood safety, community resources and access to green spaces.

The statistical analysis applied included descriptive statistics, reliability analysis, correlation analysis and regression analysis. After running the analysis, the results for the hypothesis 2 was supported, indicating a positive hypothesis. People who live in better housing conditions generally tent to have higher levels of self-efficacy and tent to feel more confident in their abilities compared to those in unfavourable living conditions.

Figure 6. HC database analysis



Overall results: For the analysis of HC on individuals the perception and the findings are the following. Most respondents tend towards positive sentiments, with higher counts in the "Somewhat Positive" and "Extremely Positive" categories compared to the negative categories. This suggests a favourable perception of the living environment among residents.

The findings indicated that a significant number of respondents (22 out of 70) have problems with noise and dust, smell, or contamination in their homes. Conversely, there is a distinguished proportion of respondents who express a sense of belonging to their neighbourhood, suggesting connection with their community. Many

respondents (65.7%) report having access to a recreation area within 200 metres of their homes, which led to contributing positively to peoples QoL. 52.9% of respondents are not worried about threats and feel secure when walking in the local area, indicating a perception of safety within the community. A small percentage of respondents (31.4%) reported concerns regarding crime, violence, or vandalism in their area.

In general, the data suggest the need, for actions and strategies to tackle the known issues while utilizing strengths to build a lively welcoming community for everyone. These efforts can help improve the well-being of residents strengthen bonds and support growth, in the community, leading to a better QoL, subsequently impacting their performance in their activities.

5.3 Hypothesis 3

While extensive research has examined the determinants of self-efficacy, the interplay between age, gender and self-efficacy remains relatively unexplored. Research in this area has shown varying results. While some studies suggest that age and gender may influence self-efficacy beliefs, others indicate that these factors might have limited or no significant effect (Larry and Wendt, 2022). This third hypothesis of this study aims to investigate how age range and gender interacts with self-efficacy beliefs.

Table 16. Standard deviation between SE and gender

Self-Efficacy vs Gender

SelfEfficacy

Gender	Mean	N	Std. Deviation
Female	23.9355	31	3.45384
Male	24.4359	39	5.27554
Total	24.2143	70	4.53614

As showed above, Table 16 displays a breakdown of self-efficacy scores by gender, including the mean (average) scores, the number of participants (N), and the standard deviation of scores for each gender as well as the total.

Female: The average of females in self-efficacy scores approximately 23.94 were 31 females participated. The standard deviation is about 3.45, indicating that most female scores fall within a range of 3.45 points above or below the mean.

Male: The average of males in self-efficacy score was slightly higher, at approximately 24.44 were 39 males participated. The standard deviation for males was 5.28, which is larger than the females one. This suggests that there is a wider spread in the self-efficacy scores among males; their scores are more varied and less mixed around the mean than the female scores.

As conclusion, males had a slightly higher average self-efficacy score than females in this study, as there were more males involved in this survey, but the difference between them both is minimal. The combined average score for all participants is 24.21, with a total of 70 contestants. The overall standard deviation was 4.54, which sits between the standard deviations for females and males. In this case, a smaller standard deviation indicates less variability, demonstrating that there is no relevance or impact between gender and self-efficacy on individuals, as more values in the dataset are within only 4.54 units of the mean.

Table 17. Standard deviation between SE and age range

Self-Efficacy vs Age

SelfEfficacy

Age	Mean	N	Std. Deviation
18 - 24	25.3571	14	2.67775
25 - 34	23.8125	48	5.15569
35 - 45	24.5714	7	2.87849
> 45	25.0000	1	.
Total	24.2143	70	4.53614

In the same way, Table 17, showed the relation between the age range in relation to self-efficacy, including the mean, number of participants and standard deviation on each age range as well as the overall total. In this case, the total average of age range is 24.21 of mean and the standard deviation of 4.53. Same as the gender range, there is no relevance or impact between age and self-efficacy on individuals, as more values in the dataset are within only 4.53 units of the mean.

A correlation analysis was also used in this hypothesis to see the effects on these variables. The results were demonstrated in the graphical and statistical representation. The results indicated that the Pearson correlation between self-

efficacy and gender was of .055 with a 2-tailed sig of .650 (see Table 18) (see Graph 3), and the outcome for the age variable and self-efficacy was a Pearson correlation of -.064 with a 2-tailed sig of .600 (see Table 19) (see Graph 4). These results indicate that there might be a connection, between self-efficacy and gender with a Pearson coefficient of 0.055. However, the 2-tailed value of 0.650 indicates that this link is not statistically significant suggesting that any observed association could be more due to chance than a relationship between self-efficacy and gender.

Likewise, the data on the correlation between age and self-efficacy reveals a coefficient of -.064 suggesting an inverse relationship where self-efficacy tends to decrease as age increases. Like the gender correlation, this relationship is also not statistically significant with a 2-tailed value of .600. Overall results indicate that while there may be associations between self-efficacy and both gender and age, these associations are very weak that they are likely to be variations rather than meaningful relationships, which in short terms the analysis could not prove enough correlation and therefore reject the hypothesis.

Table 18.

Correlations

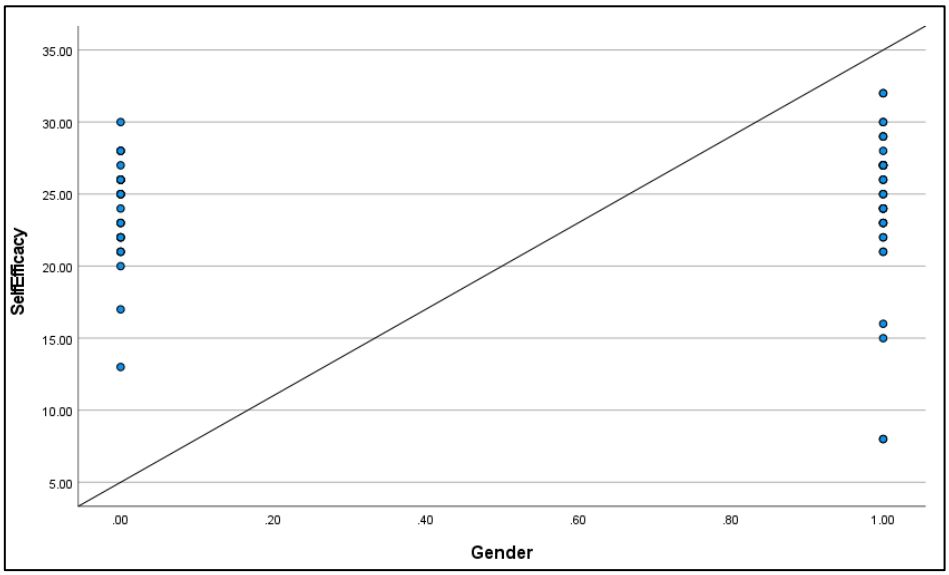
		Gender	SelfEfficacy
Gender	Pearson Correlation	1	.055
	Sig. (2-tailed)		.650
	N	70	70
SelfEfficacy	Pearson Correlation	.055	1
	Sig. (2-tailed)	.650	
	N	70	70

Table 19.

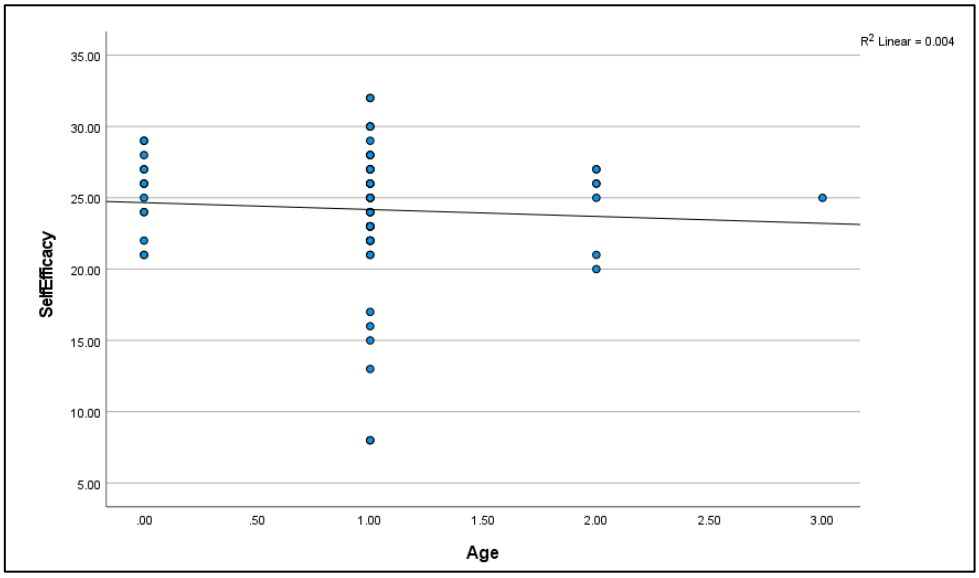
Correlations

		Age	SelfEfficacy
Age	Pearson Correlation	1	-.064
	Sig. (2-tailed)		.600
	N	70	70
SelfEfficacy	Pearson Correlation	-.064	1
	Sig. (2-tailed)	.600	
	N	70	70

Graph 3. Correlation between SE and gender



Graph 4. Correlation between SE and age range



Chapter 6

6.0 Conclusion and recommendations

The main aim of this study was on find the relation between WPE and HC on SE. The research explores some aspects related to this topic and conclude that a favourable workplace and housing conditions are increasingly recognized as crucial elements in promoting efficiency, productivity, and overall well-being in individuals' lives. The effective design of a workspace has been shown to significantly impact the working environment, indicating that a well-designed office space can help to increase many positive factors for employees like better concentration, reduce of stress and build employee confidence. Housing conditions play a vital role as well in individuals' lives, these have been linked to reduced anxiety levels, enabling people to better focus on their personal and professional lives. Furthermore, a safe and comfortable living environment not only promotes individual happiness but also contributes to stronger communities and healthier societies.

Regarding the relationship between age range and gender with self-efficacy, the findings revealed an intriguing aspect since there could be a big range of differences. While some studies indicated that age and gender may impact self-efficacy beliefs, others suggest that these factors might have no significant effect. In terms of age some research indicates that self-efficacy tends to increase as people get older due to their life experiences, ways of dealing with challenges and skill development over time. However other studies propose that the connection between age and self-efficacy may not follow that pattern. As for gender, some studies propose that men and women might perceived their self-efficacy differently with men. On the contrary, other research suggests that gender disparities in self-efficacy could depend on the situation faced. Further research may be necessary to deeply understand the effects of these variables, but as for this case of this study, the hypothesis was rejected since there were no connection between these factors and self-efficacy.

6.1 Aligned with Objectives

The primary objective is to analyse the association between outdoor and indoor environmental factors and their impact on the self-performance and productivity of foreign individuals living in Ireland.

Ireland is a country known for its abundance of nature and green spaces, but it is also known for its not so favourable climate. Most time of the year it is rainy, and the sun is not as often present as in other countries. For foreigners not used to this climate, it is difficult to ignore the weather in their daily life, since a day without sun or a rainy day completely changes the state of mind, which eventually can lead to mental health issues. Therefore, this topic became of interest to the researcher, and it was decided to analyse whether environmental factors are indeed related to the performance of each foreign individual's activities. It was also decided to consider housing conditions, given that accommodation in Ireland is a complicated issue due to the lack of available accommodation and high housing prices.

After having considered the previous studies on the subject, the literature review, the survey and the data analysis, the results were very surprising for the researcher since according to the survey conducted, the majority of the respondents confirmed to be living in favourable conditions and confirmed to be working in places where most of the IEQs (Indoor Environmental Quality) are fulfilled. At the same time, the participants confirmed that they feel good about themselves when carrying out their activities. It is important to bear in mind that the survey only covered a small part of the population in Ireland and that this does not mean that all foreigners in Ireland are in the same situation, a more in-depth and wider study would be needed to corroborate this theory.

- **Workplace Conditions and the self-performance of individuals.**

The importance of creating the right indoor environment for employees at their workplace is underlined by the impact of Indoor Environmental Quality (IEQ) on work productivity. Most people spend a significant proportion of their working week in offices. The health, comfort and stability of these indoor environments are therefore of utmost importance. The findings highlighted five key components that are critical to individual performance and productivity at work: office layout, thermal environment, air

quality, lighting environment and acoustic environment (Kang, *et al.,* 2017). For organisations seeking to optimise workplace conditions and improve employee well-being, satisfaction and efficiency, these components serve as guiding principles. As organisations increasingly recognise the tangible benefits of prioritising indoor environmental quality, efforts to create conducive workspaces are becoming an integral part of fostering a thriving workforce and achieving business success. The survey revealed that the majority of respondents were neither satisfied nor dissatisfied with their workplace in general. This indicates that there is an area of opportunity for improvement, and that organisations should consider the conditions of their facilities and workspaces in order to ensure more satisfaction in the workplace. Understanding the impact that environmental factors in the workplace have on employee performance is essential for organisations seeking to improve productivity and foster a positive working environment. By identifying which aspects of the workplace environment influence performance, organisations can take tailored action to improve productivity and employee wellbeing.

- **Housing Conditions and the self-performance of individuals.**

The study reinforces the connection, between living conditions and how individuals view their capabilities. It indicates that the quality of housing can impact peoples' self-perceptions when dealing with challenges and facing obstacles. Recent studies have emphasised the complex relationship between the housing environment and various aspects of individual performance, including self-efficacy and productivity. One of the key findings from the study is the strong link between environmental factors in the housing environment and individuals' SE. For instance, perceived problems with crime, violence or vandalism in residential areas, concerns about safety outside home, and problems with noise or pollution inside the home have all been identified as significant predictors of mental health outcomes. The survey shows that the participants are somewhat satisfied with the place where they live and their environment, with the answer to most questions being 'somewhat positive'. At the same time, the relationship between SE showed that the participants were mostly satisfied with themselves, their decision making and their effectiveness in solving everyday problems. This shows that the better people's housing conditions are, the better their self-esteem and self-belief develop, leading to better performance and effectiveness in their daily activities.

6.2 Research recommendations

The principal aim of this research is to transmit conscious to our societies and governments about how climate change not only impacts the environment we are living in, but our health and the way we develop as individuals and as societies. There is a lot of work to do in order to expose the relation between these two big problems but there is also a lot of things the human being can do to avoid or at least try to control them. It is important to work on oneself and be aware that everything related to the environment is affecting people directly and indirectly in their daily lives and that if people continue to pollute without taking care of the environment, the climatic conditions will continue to change and the effects of the climate will only get worse, not only in Ireland but around the world. Understanding the impact of housing conditions on peoples' well-being is essential for policymakers, urban planners, and community stakeholders seeking to promote healthy and thriving communities. Poor housing conditions and unfavourable living environments have been associated with a range of negative results in the society. On the other hand, it is recommended that companies also pay attention to the conditions of their offices, in order to provide their employees with a good place to work. This will lead to fewer physical and mental health problems and thus to better results and higher performance.

Annex

Table 1. Gender

Gender

		Value	Count	Percent
Standard Attributes	Label	Gender		
Valid Values	.00	Female	31	44.3%
	1.00	Male	39	55.7%

Table 2. Age Range

Age Range

		Value	Count	Percent
Standard Attributes	Label	Age		
Valid Values	.00	18 - 24	14	20.0%
	1.00	25 - 34	48	68.6%
	2.00	35 - 45	7	10.0%
	3.00	> 45	1	1.4%

Table 3. Nationality

Nationality

		Value	Count	Percent
Standard Attributes	Label	Nationality		
Valid Values	.00	Mexican	24	34.3%
	1.00	Italian	8	11.4%
	2.00	Greek	1	1.4%
	3.00	Pakistani	1	1.4%
	4.00	Honduran	1	1.4%
	5.00	Paraguayan	1	1.4%
	6.00	Nigerian	5	7.1%
	7.00	Indian	16	22.9%
	8.00	Mongolian	2	2.9%
	9.00	Turkish	2	2.9%
	10.00	South Korean	1	1.4%
	11.00	Dutch	1	1.4%
	12.00	Portuguese	1	1.4%
	13.00	Chilean	1	1.4%
	14.00	Brazilian	2	2.9%
	15.00	Spanish	1	1.4%
	16.00	South African	2	2.9%

Table 4. Time living in Ireland

Time living in Ireland

		Value	Count	Percent
Standard Attributes	Label	TimeLivingInIreland		
Valid Values	.00	0 - 6 months	13	18.6%
	1.00	6 months to 1 year	10	14.3%
	2.00	1 year to 3 years	31	44.3%
	3.00	3 years to 5 years	8	11.4%
	4.00	5 years or more	8	11.4%

Table 5. Urban setting living

Urban setting living

		Value	Count	Percent
Standard Attributes	Label	UrbanSetting		
Valid Values	.00	Yes	65	92.9%
	1.00	No	5	7.1%

Table 6. Descriptive Statistics

Descriptive Statistics

	N	Mean	Std. Deviation
SelfEfficacy	70	24.2143	4.53614
WorkPlaceEnv	70	21.2857	4.70012
HousingConditions	70	16.6000	3.13651
Valid N (listwise)	70		

Table 11. Noise sources that occur to get people distracted at work

Noise sources that get people more distracted at work	Frecuency	Percentage
Construction	2	2.9%
Construction, Conversation, Door closing	1	1.4%
Construction, Conversation, Entertainment, Phone ringing, Door closing, Machines, Footsteps, Human activity	1	1.4%
Construction, Conversation, Entertainment, Phone ringing, Door closing, Machines, Footsteps, Traffic noise, Human activity, Keyboard sound, None	1	1.4%
Construction, Conversation, Traffic noise	1	1.4%
Construction, Phone ringing, Door closing, Human activity	1	1.4%
Construction, Phone ringing, Machines, Traffic noise	1	1.4%
Construction, Traffic noise	1	1.4%
Construction, Traffic noise, Human activity	1	1.4%
Conversation	3	4.3%
Conversation, Entertainment	1	1.4%
Conversation, Entertainment, Human activity	1	1.4%
Conversation, Entertainment, Machines	1	1.4%
Conversation, Entertainment, Machines, Human activity	2	2.9%
Conversation, Entertainment, Phone ringing, Door closing, Machines, Footsteps, Traffic noise, Human activity	1	1.4%
Conversation, Footsteps, Human activity	2	2.9%
Conversation, Human activity	4	5.7%
Conversation, Human activity, Keyboard sound	1	1.4%
Conversation, Phone ringing, Door closing, Human activity, Keyboard sound	1	1.4%
Conversation, Phone ringing, Door closing, Machines, Human activity	2	2.9%
Conversation, Phone ringing, Human activity	2	2.9%
Conversation, Phone ringing, Machines, Human activity	1	1.4%
Conversation, Traffic noise, Human activity	1	1.4%
Door closing	1	1.4%
Entertainment	1	1.4%
Entertainment, Machines, Footsteps, Traffic noise, Human activity	1	1.4%
Entertainment, Traffic noise	1	1.4%
Entertainment, Traffic noise, Human activity	1	1.4%
Human activity	4	5.7%
Machines	1	1.4%
Machines, Traffic noise	1	1.4%
Machines, Traffic noise, Human activity	1	1.4%
Machines, Traffic noise, Keyboard sound	1	1.4%
None	20	28.6%
Phone ringing, Door closing, Footsteps, Human activity	1	1.4%
Phone ringing, Door closing, Machines, Footsteps, Keyboard sound	1	1.4%
Phone ringing, Door closing, Machines, Human activity	1	1.4%
Phone ringing, Door closing, Traffic noise	1	1.4%

Table 20. ANOVA analysis

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	286.243	2	143.121	8.459	<.001[b]
	Residual	1133.543	67	16.919		
	Total	1419.786	69			

a. Dependent Variable: SelfEfficacy

b. Predictors: (Constant), WorkPlaceEnv3, HousingCond3

Appendix

Survey Questionnaire:

Demographics / QoL = Quality of Life Survey.

1. Gender
   Male / Female / Other
2. Age group
   18-24
   25-34
   35-45
   <45
3. Living in an urban setting
   Yes / No
4. What is your nationality?
5. How long have you been living in Ireland?
   - 0 - 6 months
   - 6 months to 1 year
   - 1 year to 3 years
   - 3 years to 5 years
   - 5 years or more
6. What is your seat position at the place you work at?
   - Window seat (sitting near the window)
   - Door seat (sitting near the door)
   - Neither near a window or door (NWND)
7. How do you feel about the equipment at your workplace?
   - Very dissatisfied
   - Dissatisfied
   - Neutral
   - Satisfied
   - Very Satisfied
8. How do you feel about the personal space at your workplace?
   - Very dissatisfied
   - Dissatisfied
   - Neutral
   - Satisfied
   - Very Satisfied

9. How satisfied are you with the ventilation at your workplace?
    - Very dissatisfied
    - Dissatisfied
    - Neutral
    - Satisfied
    - Very Satisfied

10. How satisfied are you with the air freshness at your workplace?
    - Very dissatisfied
    - Dissatisfied
    - Neutral
    - Satisfied
    - Very Satisfied

11. How satisfied are you with the artificial lightning at your workplace?
    - Very dissatisfied
    - Dissatisfied
    - Neutral
    - Satisfied
    - Very Satisfied

12. How satisfied are you with the natural lightning at your workplace?
    - Very dissatisfied
    - Dissatisfied
    - Neutral
    - Satisfied
    - Very Satisfied

13. How is the acoustic environment at the place you at?
    - Quietness
    - Noise sources

14. If you answered “noise sources” to the previous question, select which of the followings get you more distracted at work?

    Construction
    Conversation
    Entertainment
    Phone ringing
    Door closing
    Machines
    Footsteps
    Traffic noise

Human activity
Keyboard sound

15. How do you feel about the temperature at your workplace?
    - Very dissatisfied
    - Dissatisfied
    - Neutral
    - Satisfied
    - Very Satisfied

16. How is the humidity at your workplace?
    - Very dissatisfied
    - Dissatisfied
    - Neutral
    - Satisfied
    - Very Satisfied

17. How satisfied you feel with the area/village/district you live in
    - Extremely negative
    - Somewhat negative
    - Neutral
    - Somewhat positive
    - Extremely positive

18. How satisfied are you with your housing
    - Extremely negative
    - Somewhat negative
    - Neutral
    - Somewhat positive
    - Extremely positive

19. Do you feel that you belong to the residential area you live in?
    - Extremely negative
    - Somewhat negative
    - Neutral
    - Somewhat positive
    - Extremely positive

20. Do you feel safe when walking out in the local environment?
    - Extremely negative
    - Somewhat negative
    - Neutral
    - Somewhat positive
    - Extremely positive

21. Do you face problems with noise at home?
    - Yes
    - No

22. Do you face problems with dust, smell, or contamination at home?
    - Yes
    - No

23. Is there an area for play and recreation within 200 m of your home?
    - Yes
    - No

24. Do you face problems with crime, violence, or vandalism in residential area you live in?
    - Yes
    - No

25. Do you feel worried about violence or threats when walking outside and alone?
    - Very or somewhat worried
    - Not worried

26. I can always manage to solve difficult problems if I try hard enough.
    - Not at all true
    - Somewhat true
    - Mostly true
    - Exactly true

27. If someone opposes me, I can find the means and ways to get what I want.
    - Not at all true
    - Somewhat true
    - Mostly true
    - Exactly true

28. It is easy for me to stick to my aims and accomplish my goals.
    - Not at all true
    - Somewhat true
    - Mostly true
    - Exactly true

29. I am confident that I could deal efficiently with unexpected events.
    - Not at all true
    - Somewhat true
    - Mostly true
    - Exactly true

30. I can solve most problems if I invest the necessary effort.
    - Not at all true
    - Somewhat true
    - Mostly true
    - Exactly true

31. When I am confronted with a problem, I can usually find several solutions.
    - Not at all true
    - Somewhat true
    - Mostly true
    - Exactly true

32. If I am in trouble, I can usually think of a solution.
    - Not at all true
    - Somewhat true
    - Mostly true
    - Exactly true

33. I can usually handle whatever comes my way
    - Not at all true
    - Somewhat true
    - Mostly true
    - Exactly true

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