# The Effect of Using Color in the interior Design on the Psychological State of Workers Within Administrative Spaces

**Prof. Dr. Said Hassan Abdel Rahman**

**Professor of Administrative Design, Department of Interior and Furniture Design**

**Faculty of Applied Arts - Helwan University**

**Prof. Dr. Doaa Abdel RahmanMohamed**

**Professor of Design Fundamentals, Department of Interior and Furniture Design**

**Faculty of Applied Arts - Helwan University**

**Enas Mohamed Abdel Hamid Gohar**

**Interior Designer - Interior Design & Furniture Department**

**Faculty of Applied Arts - Helwan University**

enasgohar94@gmail.com

**ABSTRACT**

Colours in work environment have an active role in developing the human mood. During Centuries, Colours were used to distinguish and differentiate between things. Colours reflect directly on employee's production, the capacity for innovation and creativity. The problem lies in lack of a suitable colour environment in administrative spaces which effects on employee's mood. For example, choosing the suitable colours, textures and aesthetic values integrated with functional values have a big effect on the psychological side of employees. Depending on the descriptive analytical method, this case study has been done.

As a result of my case study, participants' response effected by the colour on workplace. Twelve colours (warm, cold & neutral) were used in the participatory research. The results showed that the colours which made them feel positive or happy, were (mint green, light blue and dark orange), and the colours that made them feel negative or sad, were red, pink and yellow.

In this study, 35 employees in diverse workplaces from different countries like (Pakistan, Oman, Germany, England, Egypt, Kuwait, India and South Africa) volunteered to participate, who are ranging in age from 21 to 60 years old. The results indicated that the colour, lightening and the green areas affected on participants' aesthetic and psychological evaluation. 70% of the participants in age between 21to 30 chose white & grey offices with a touch of green. Blue, orange, and lighter colours were the choice of the rest. In terms of visual comfort, being comfortable, and relaxing, the cool-coloured area is often seen as more favourable. Warm-coloured spaces tend to give off a more vibrant, bright, and warm feeling. As a conclusion, the results suggested that the colour and lightening have positive psychological effect on participants' response at work environment.

**KEYWORDS:**

Meaning of colour- Design psychology - Administrative places

**الملخص:**

تلعب الألوان في بيئة العمل دورا نشطا في تطوير المزاج البشري. خلال القرون، تم استخدام الألوان  للتمييز والتفريق بين الأشياء. تنعكس الألوان مباشرةً علي إنتاج الموظف والقدرة علي الإبتكار والإبداع .وتكمن المشكلة في عدم وجود بيئة ألوان مناسبة في المساحات الإدارية  مما يؤثر علي مزاج الموظف. علي سبيل المثال ، اختيار الألوان والملمس والقيم الجمالية

المناسبة والمتوافقة مع القيم الوظيفية له تأثير كبير علي الجانب النفسي للموظفين. وتم إجراء هذه الدراسة اعتمادا علي المنهج الوصفي التحليلي.

ونتيجةً لهذه الدراسة، كان للون في مكان العمل أثر على استجابة المشاركين. تم استخدام اثني عشر لونا (دافئ وبارد ومحايد) في البحث التشاركي. أظهرت النتائج أن الألوان التي جعلتهم يشعرون بالإيجابية أو السعادة كانت (الأخضر والأزرق الفاتح والبرتقالي الداكن) والألوان التي جعلتهم يشعرون بالسلبية أو الحزن كانت (الأحمر والوردي والأصفر).

في هذه الدراسه ، تطوع ٣٥ موظفا في أماكن عمل متنوعة من دول مختلفة مثل (باكستان ،عمان ،ألمانيا، إنجلترا، مصر،الكويت، الهند وجنوب افريقيا) للمشاركة، تتراوح أعمارهم بين ٢١و ٦٠عام. أشارت النتائج إلى أن اللون والضوء والمساحات الخضراء أثرت على التقييم الجمالي والنفسي للمشاركين. اختار ٧٠٪ من المشاركين الذين تتراوح أعمارهم بين ٢١ و ٣٠ عاما مكاتب بيضاء ورمادية بلمسة من اللون الأخضر. و كانت الألوان الزرقاء والبرتقاليه والألوان الفاتحة اختيار الباقين . من حيث الراحة البصرية والاسترخاء، غالبا ما ينظر إلى المنطقة الملونة الباردة على أنها أكثر ملاءمة. وتميل المساحات ذات الألوان الدافئة إلى إعطاء شعور أكثر حيوية وإشراقا ودفئا. وأشارت النتائج إلى أن اللون والضوء لهما تأثير نفسي إيجابي على استجابة المشاركين في بيئة العمل.

**مصطلحات البحث:**

تعريف اللون – سيكولوجية التصميم – الأماكن الإدارية

## 1. INTRODUCTION AND RATIONALE
### o INTRODUCTION

Employees spend most of their time in administrative places, so a suitable environment must be available to them that includes functional, psychological, and practical needs to stimulate and inspire them. Generally, work environment effects on the psychological state and employee's mood.

One of the most important considerations that must be taken into account is colour, as it stimulates work and creates an atmosphere of activity, movement. Because of the great psychological pressure that workers in administrative places are exposed to within their work environment, the colours used have a great role in linking aesthetic values with functional values. As well as, it helps in developing the foundations and design principles through the internal coordination of the administrative spaces, furniture elements and the importance of green surfaces, considering the economic factor and environmental compatibility.

It is noticeable that the colours present in most administrative places are inconsistent, as they do not stimulate innovation, creativity, and production. Additionally, the work environment has an active role in developing the human wellbeing and using it to distinguish and differentiate between things, which is an effective part in improving, developing the production, the capacity for innovation and creativity.

### o KEY WORDS AND DEFINITIONS

**Meaning of colour:** Colour is defined as the physiological effect generated in the retina caused by a light beam of a specific wavelength, whether it is caused by the color pigment material or

from coloured light, and the difference in the length of the wave makes us distinguish between one color to another (Robert, 1968).

Colours also have characteristics and recipes known as the origin of colour "Hue", colour value "value" and colour intensity "Chroma" (Al-Shiaali, 2007: 60).

**Design psychology**: It is the study of the relationship between the environment and the internal space. It describes, how this relationship affects the user. It also improves the individual's performance, the efficiency of the vacuum, and the extent of employee's well-being (Israel, 2014).

**Administrative places:** Administrative buildings or offices are known as the workplace in which the employee spends most of their day and performs their duties (Newcastle, 2019)

o **RESEARCH PROBLEM**

The lack of a suitable colour environment in administrative spaces which effects on employee's mood.

**RESEARCH QUESTIONS**

• Is the work environment suitable for employees and helps them to innovate, create and develop?

• Why is work environment helps employees to innovate, develop and increase production?

• How do we make a work environment conducive to innovation, creativity, development, and relaxation, which affects the productive and psychological state of workers?

•

o **RESEARCH OBJECTIVES**

Studying the design and technological foundations of color with a focus on the psychological impact of colour on employees in administrative spaces, in terms of employing color, texture and aesthetic values integrated with functional values.

o **RESEARCH IMPORTANCE**

This research is focused on:

• Identify the effect of colour on the psychological state of workers in administrative places.

• Create an environment conducive to creativity and innovation within the administrative spaces.

• The ability to work on development and increase production in administrative places.

o **RESEARCH HYPOTHESIS**

• Colour and texture play an important role in influencing workers inside administrative places**.**

• Achieving mutual integration between aesthetic values (design lines - size of spaces – color) and functional values in administrative spaces help to raise functional efficiency, which leads to increase production.

• The usage of environmentally friendly interior materials that affect positively on workers in administrative places.

- The green spaces in the exterior and interior design play a role in psychological comfort within the administrative spaces.

o **RESEARCH LIMITS**

**Time limits:** Research preparation time (current time).

**Place Limits:** Administrative places in Egypt.

o **RESEARCH METHODOLOGY**

**Descriptive analytical method:**

An analytical descriptive study will be conducted for some models of administrative places in Egypt and international models.

**Applied method:**

Applying the most important criteria of the previous study to a proposed applied project.

o **RESEARCH PROCESS**

| Research Process | Point Covered |
|---|---|
| Studying the foundations and standards of colour in administrative spaces | - The functional and aesthetic values<br>- The physiological effect of colour on workers |
| Studying the technological foundations of colour and how to apply them in administrative spaces | - The natural and social environment<br>- Finishing materials for (floors, walls...) |
| Analytical study of administrative spaces | - Qualitative research |
| Applied study for administrative spaces | - Applied project in Egypt |

TABLE 1 -RESEARCH PROCESS (RESEARCHER 2022)

## 1. CONTEXTUAL TERRITORY
**What is the positive psychology?**



FIGURE 1- PERMA MODEL OF WELL-BEING (SELIGMAN, M., 2018)

We spend usually more than 8 hours daily at work, so it is important for us to enhance strengths, flexibility, and use positive psychology techniques at workplaces. **Martin Sleighman** developed an evidence-based model of well-being known as **PERMA** as seen in figure 1: Positive Emotions, Engagement, Positive relationships, Meaning, and Achievement.

Let's read on to find out, how PERMA can be introduced into the workplace, preparing a flexible and positive work environment!

We thrive when we are happier. When we feel joyful, we tend to set higher goals and persevere to achieve them. We are better able to deal in stressful situations and demonstrate better problem-solving and teamwork skills.

How to make people happier at workplace? One way is to develop a grateful mindset by calculating positive signals. In doing so, we train our state of mind to look for and taste positive events, rather than allowing them to drown in negative events. Practice this over time, and you'll notice your happiness levels increase in the workplace. Individuals with high professional well-being are more likely to thrive.

When we have a suitable workplace that makes us feel comfortable and gives us the opportunity to share our ideas together. That will help us to have the sense of active focus and concentrate about our next challenge for success. One way to increase workplace engagement is to design jobs to better suit individuals' motivations, strengths, and passions.

By providing opportunities for employees to explore and use their individual strengths at work, enjoy work and increase the productivity can be reached.

Positive relationships studies have shown that social well-being plays an integral role in our well-being. If we don't have strong social relationships in our lives, our ability to thrive is limited. Through healthy relationships, we are better able to control stress. Since we spend a great deal of our time at work, it is therefore important to invest in social relationships at workplace. Companies can provide opportunities for employees to socialize, encourage them to meet each other outside of work and have balancing between their private and work life. Fostering healthy relationships in the workplace leads to a noticeable significant impact on the company. That means, it is important for us to define our meaning of life, so that we can get the intrinsic goal to work and increase our satisfaction with life, happiness, and well-being.

"If health is the essence of your brand, it all starts with taking the health of your workforce very seriously" Marnix Eikenboom (President, Danone)


**Referring to figure 2, engineering the perfect office depends on many factors that can affect on workers in the work environment: -**

**1. The Interior design of the office:**

• Pops of colour:

People used colours in their lives every day and they are under pressure most of the time. So, we need the surrounded colours to be changed to make people feel better. After doing the survey, the results showed that there is difference between people saying and people thinking. The objective of this study is to make panels from environmentally friendly recycled material with low cost that can be changed every six months or a year, and it will help them to develop and improve their wellbeing.
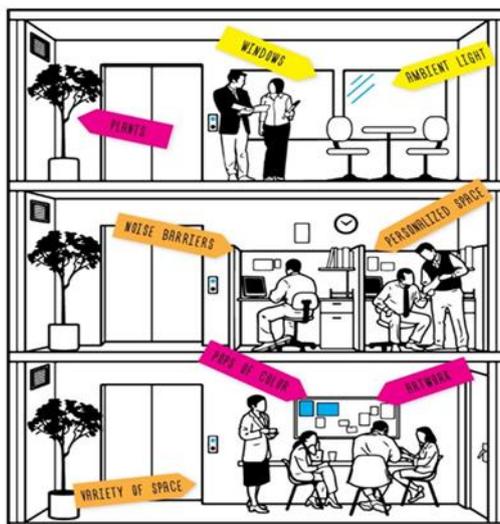
**FIGURE 2- ENGINEERING THE PERFECT OFFICE: HERE'S WHAT SCIENCE AND DESIGN HAVE TO SAY ABOUT CREATING THE BEST POSSIBLE KIND OF WORKSPACE**

- Natural environment:

The importance of natural environment on workplace is to make workers relax and improve psychological state of them. In addition, green area affects the productivity and helps the employees to innovate, create and develop.

- Artwork:

should be simple to not disturb them in their work.
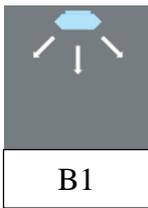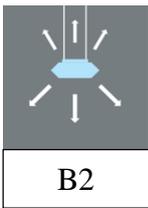
**2. Lightening:**

- Natural lightening:

"Daylighting" is the utilisation of natural light, skylights, and overcast sky illumination to create effective interior lighting that is suited for certain programmatic areas while also being comfortable for the employer. For achieving more goals through the employees, an improvement of the workplace with a sufficient daylighting is needed.

The following points are some of the advantages of daylight-illuminated buildings:

o Healthier and better-quality interior environment for workers.

o Increased employee's productivity.

o Increased human comfort.

o Mental and visual stimulation required for healthy brain chemistry regulation.

- Office lightening:

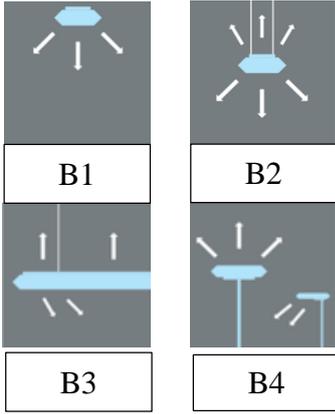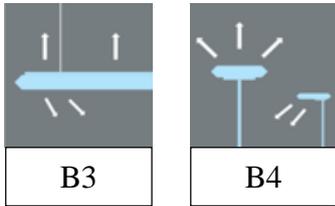| Lighting concepts | | Types of lighting |
|---|---|---|
| **Room-Related Lightening** | Throughout the space, uniform illumination creates the same visual circumstances. This is advised, when the work area organisation is unclear during the design phase or when the task area arrangement has to be flexible. | B1    B2 |

| | | |
|---|---|---|
| **Task Area Lightening** | Task areas and the space surrounded require different illumination. this is advised, when a room comprises numerous work areas that are required to handle distinctive visual activities and such have variable illumination requirements. It's also a good solution in situations when visual limits are required to distinguish between different working groups. | B1    B2 <br> B3    B4 |
| **Work Surface Lightening** | Workplace luminaires can be used to complete "basic lighting", which might be room-related or task-area lighting to provide a level of lighting that is precisely suited to the visual job or to personal interests. DIN 5035-8 specifies workplace luminaire standards and suggestions. | B3    B4 |
| B1**: Direct lighting** (ceiling luminaires).<br>B2**: Direct/indirect lighting (**pendant luminaires).<br>B3**: Task lighting with special optical control** (pendant luminaires).<br>B4**: Indirect lighting with direct workplace lighting** (standard and desktop luminaires). | | |

**Table 2 - Three lighting concepts for offices (Licht, F., 1992)**

According to table 2, Increasing the internal light and reflect of its colours in office will show the connection between the aesthetic and the dynamic value.

## 3. Space:

- Noise Barriers:

The noise barriers are used to avoid transmission of sounds and help people to focus on work. According to research, workers in open offices are more likely to report noise, as well as temperature-related discomfort and poor air quality, than those in cellular offices. In open offices, noise is also a popular source of distraction.

- Personalized space:

The workers need mostly their personal space at work, as this kind of privacy helps them to be more concentrated while working.

- Varity of spaces:

Employees need spaces to get rid of their psychological pressure and convert it to positive energy.

## 2. ANALYTICAL STUDY

The ideas, tools, and procedures employed in data gathering or proof of evidence to seek current information and better comprehend a subject are referred to as research methodologies (Newcastle, 2019). So, the suitable method for this research is the qualitative study.

**A qualitative study:** is a method for deciphering and analysing the meaning of people or meetings who have been allocated to a common or human concern. Data is usually acquired in part setting (Phillips & Burbules , 2000) and information review is inductive from facts to broad subjects.

A program for assessing changes, inductive form, and a spotlight of individual importance, as well as the sensation of comprehending a condition's complexity existence should be cared from the society (Phillips & Burbules , 2000).

The approaches used at the above-mentioned study to gather research data include:

1. Interviews: interviews with researchers and interviewers might be in-depth, organised, semi-structured, or unstructured sessions (Newcastle, 2019).

2. Focus group: a discussion with many people about a given topic or set of questions. Researchers can be either observers or organisers (Newcastle, 2019).

3. Observation: choices include on-site, set-up, and part-play observation (Newcastle, 2019).

4. Document analysis: correspondence interrogation (books, periodicals, communications, etc.) and reporting (Newcastle, 2019).

5. Recollection and remembering of the researcher's experience (speech history or life experiences (Newcastle, 2019).

Using qualitative research methodologies and processes has several benefits. To start with, qualitative research approach requires a detailed in-depth characterization of participants' thoughts, opinions, and views (Denzin, 2002). Secondly, qualitative research assists researchers in exploring individuals' inner experiences and understanding how meanings are generated through and in society.

Beyond the advantages, there are evident drawbacks. Firstly, according to Silverman (2010), qualitative research methods may disregard contextual sensitivity to focus non definitions and perceptions. Secondly, policymakers could not agree with the results of a qualitative method.

**Analysing**

Analytical study of administrative spaces, including examples from many nations throughout the world, examining and comparing it to the work environment before Corona pandemic and the environment of home offices.

All the study's results will be presented at this part. The data for this study was gathered from people ranging in age between 21 to 60 years old in diverse workplaces. Interviews were done in a semi-structured format. As previously stated, the proposed study uses a qualitative research approach.

This section, evaluating and summarising the outcomes of the study using pie charts to reflect the outcomes of this study, used Google Survey to analyse all of the questionnaire data and create pie charts.

**Procedure for sampling**

The sampling technique includes selecting a sample of a population to test assumptions (Adam, 2019) and is used to select the number of participants, interviews, or work samples that will be included in the assessment. Statistical selection processes, such as random or stratified sampling (Adam, 2019), should be used if the sample data will be generalised to reflect the population.

A simple random sample is the selection of a subgroup of statistical populations so that each subgroup has equal opportunities to choose. A basic random sample is intended to represent a group in an unbiased manner (Adam, 2019). This method has the advantage of avoiding the requirement to divide the population into sub-groups or conduct any other additional procedures before picking.

The drawback is, if the sample does not properly reflect the population that is designed to represent, a sampling error might be developed (Adam, 2019). Employees who took part in this survey, were picked randomly and were not be divided into categories.

**Interpretation of data and analysis**

Data analysis is the process of examining data using analytical and statistical methods to identify meaningful data and aid in commercial decision-making (Sridhar, 2018). The responses of the participants were used to analyse the data. The replies were collected using a Google form, which was then applied to make graphs and charts.

**Tools for collecting information**

Methodology refers to ways of gathering and analysing information on target variables in a standard format so that relevant questions can be asked, and outputs can be assessed. Several areas of study, including physical and social sciences, humanities, and business, require data gathering (Vuong et.al, 2018).

While the methodologies vary per discipline, the importance on accurate and genuine data collection remains constant. The purpose of collecting information is to collect high-quality evidence that can be analysed to produce convincing and reliable responses to the issue that has been posed (Vuong et.al, 2018). As it is well known, there are various sorts of research methods, and each type of research method has its own set of tools for gathering data. The researcher focused on the emotion of employees in a work environment, so this study used a qualitative research style.

**Applied project, Conclusions, and recommendations**

In conclusion, this part outlines the major findings of the research based on the research questions. There were certain ethical issues to be solved, such as the data collection methods. A discussion of the consequences of this study will be provided, with a focus on future research.

3. **LITERATURE REVIEW**

**Sheffield Children's Hospital**

As shown at figure 3, British designer Morag Myerscough had to follow strict clinical guidelines to bring her bright colours and harlequin prints to the wards of this children's hospital in northern England. Avanti Architects added a new wing to the hospital, and she created 46 en-

suite bedrooms and six multi-occupancy suites for it. The goal was to make the rooms feel more welcoming and warmer.



**FIGURE 3: SHEFFIELD CHILDREN'S HOSPITAL IN NORTHERN ENGLAND, BY BRITISH DESIGNER MORAG MYERSCOUGH (AOUF, R., 2021)**

Although Myerscough's colourful, graphic style appears to be ideal for children's rooms, the design process was not simple. Some of the rooms were painted in a lighter colour scheme to accommodate youngsters with autism or others who are sensitive to strong patterns. She also designed the rooms to feel like young children belonged to a home with older children.
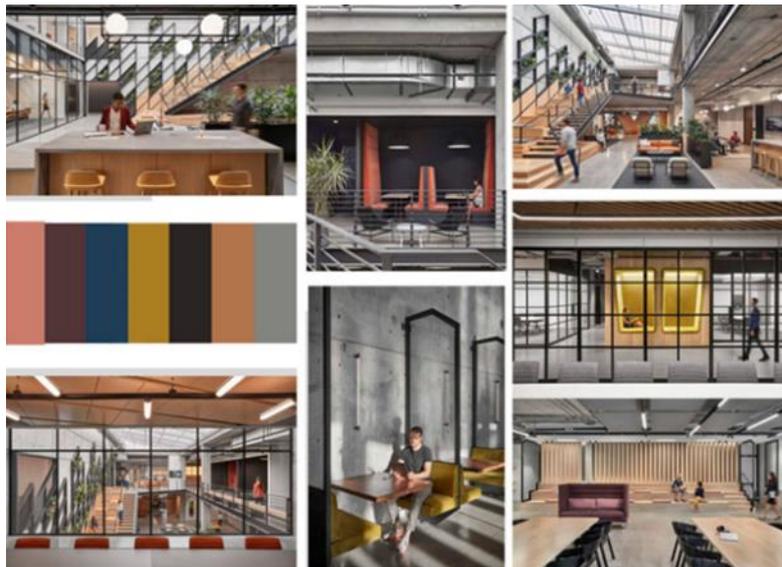


**Figure 4- Alternative Technology Client Offices,**
**Austin (https://officesnapshots.com/2020/06/22/alternative-technology-client-offices-austin)**

**Alternative Technology Client Offices – Austin**

According to figure 4, the interiors, which Revel changed from a multi-tenant office building into a single tenant building for our long-time client out of San Francisco, are built on a foundation of progressive spatial arrangement, exposed infrastructure, and stark contrast. The design is highlighted using genuine architectural materials that helps to give the office a distinctive style.

My review is most of the practical companies use colours include warm, cold, and neutral with multiples spaces for work to encourage employees to work, which will be a positive side in increasing companies' production, because it effects on workers mood and creativity.

4. **RESEARCH METHODOLOGY & DESIGN**

o **METHOD**

The research study is primarily based on the qualitative approach in analysing the employee's emotions towards their office's colours.

o **SAMPLE SIZE**

The researcher planned to make survey for 100 employees between 21 to 60 years old from different practical companies. With this questionnaire the researcher will discover how people feeling towards the colours in their work environment and analysing the answers, the researcher is convinced that effective and appropriate information will be acquired.

o **RESEARCH INSTRUMENTS**

Questionnaires were employed in this study to gather data from people who had previously worked in practical companies such as (video game company & technology company). Questionnaires were utilised since they are recognised to be a low-cost, rapid, and efficient method of gathering many participants. The research will then be able to bring the concept for the applied project together.

o **SWOT ANALYSIS**

| STRENGTH<br>▪ Using colours will help workers to create, develop and innovate. | S W | WEAKNESS<br>▪ Most companies are using neutral colours.<br>▪ Workers under pressure all the time. |
|---|---|---|
| THREAT<br>• High costs of the environmentally friendly recycled materials. | T O | OPPORTUNITIES<br>▪ Developing new things.<br>▪ increasing production. |

o **DATA ANALYSIS AND INTERPRETATIONS**

**Sample size**

This paper's target group was for people all over the world. 50 questionnaires were sent out and a total of 35 responses were sent back and they shared their perspectives about their prior workplace. A group of people of varied ages completed an online questionnaire. The researcher picked an online questionnaire since it is known to be less expensive, more time-efficient, and participants do not feel forced, able to respond when they have the time, resulting in more accurate responses.

o **CONSIDERATION OF ETHICAL ISSUES**

When it comes to ethical considerations in dissertations, (Bryman &Bell 2007) identify the most significant principles. Which ones are they?

• There should be no harm done to any of the research volunteers in any form.
• At all times, the dignity of study participants should be respected and prioritised.
• Prior to the study, all participants should give their permission.

- It must be ensured that participants' privacy is maintained.
- The confidentiality of the data in the study should be guaranteed.
- The anonymity of any person or organisation taking part in the study should be guaranteed.
- Generalizations of the study's goals and objectives should be avoided.
- Avoid utilising deceptive information and representing data that is inaccurate.

## 5. OUTCOME

### ✓ What have I learned from this?

The importance role of colour in human wellbeing and the effects of it on employees is helping them to be creative and give them passion to make new things in their work environment. Furthermore, natural environment helps us less the pressure that we are facing every day, because people spend almost 50% of their time in their office, so they need green area to fell more relax and natural. At these days, we are facing a global pandemic which turned our life and force most people work from homes (Home Office), so we need some changes in our workplaces to help us create and develop new products. Also, most people redesigned their houses to make it suitable for them to work.

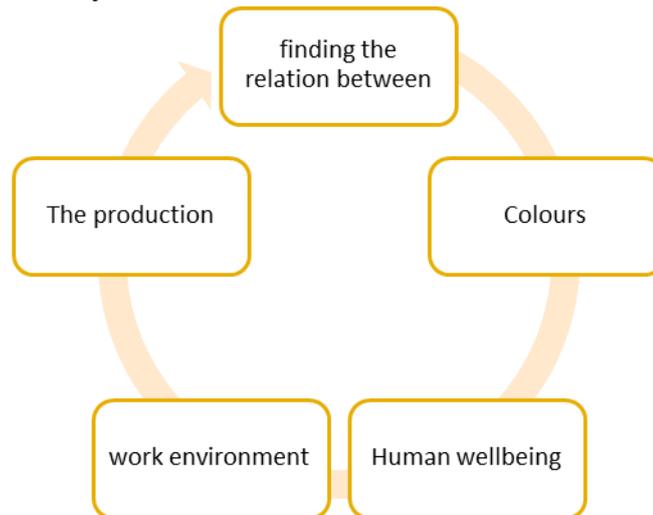### ✓ What does this mean for my future?



**FIGURE 5 – THE RELATIONSHIP BETWEEN COLOURS, HUMAN WELL-BEING, WORK ENVIRONMENT AND PRODUCTIVITY, AND HOW IT AFFECTS IN OUR LIFE AND WELLBEING. (RESEARCHER 2022)**
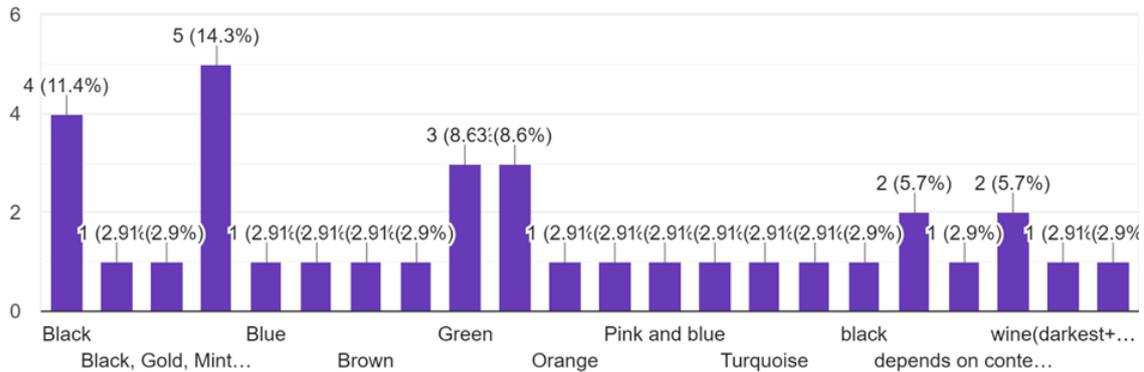
## 8. RESEARCH RESULTS

### Survey Results

35 employees from people ranging in age from 21 to 60 years old in diverse workplaces from different countries like (Pakistan, Oman, Germany, England, Egypt, Kuwait, India, and South Africa) are volunteered to participate at this study.

The results indicated that the colour, lightening and the natural environment effect on participants' aesthetic and psychological evaluation, most of them spend 40 hours per week in their work. 70% of the participants in age between 21to 30 chose (white & grey offices with a

touch of green). And the rest of them preferred (blue, orange, and lighter colours) in their offices.
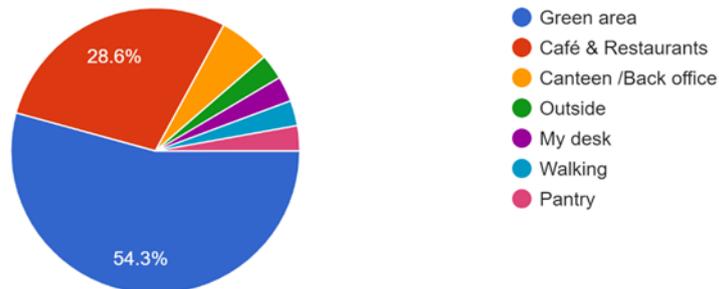
✓ What is your favourite colour?



✓ How satisfied are you with your office colour?
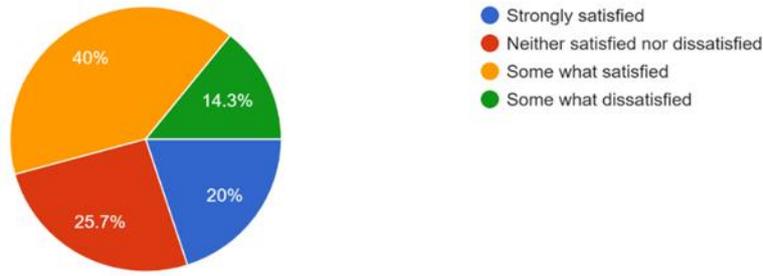


✓ What is your favourite place while taking your break?



**Participatory Research**

In this research (Figure 6), I have used twelve colours (warm, cold & neutral). The results showed that the colours that made them feel positive or happy are (mint green, baby blue and dark orange) while the colours that made them feel negative or sad in their offices are (red, pink, and yellow).

**Figure 6 –colour palette (Researcher 2022)**

| According to (Figure 6) which colour makes you feel more positive or happy and you can put it in your office? | According to (Figure 6) which colour makes you feel more negative or sad and you can put it in your office? |
|---|---|
|  |  |

**Table 3- results-oriented from applied study (Researcher 2022)**

## 9. CONCLUSION

In conclusion, the primary objective of this study was to investigate workers in administrative spaces. To support the problem statement, the context of the experiment was explained in detail, and the research goals of this study were stated as to the intent of it.

The way used as the research method a qualitative method from people participation, using questionnaires as a tool in gathering information from participants in work environment.

## 10.   RECOMMENDATIONS

• Designers and owners of companies should pay attention to colours within administrative places, as it is an effective element in influencing the psychological state and mood of employees in workplace environment.

- We should shed light on lighting and its psychological and functional impact on workers within administrative places, considering natural and appropriate ventilation factors in the design of administrative spaces.

The keenness to apply international quality standards in administrative facilities leads to obtaining an administrative space that conforms to international standards, which creates an atmosphere of psychological comfort, helps creativity &innovation, and increases productivity.

## 11.    REFERENCES

1. Bryman, Alan. Social Research Methods. Oxford: Oxford University Press, 2012.

2. Denzin, Norman K., and Yvonna S. Lincoln. The Qualitative Inquiry Reader. Thousand Oaks, CA: Sage Publications, 2002.

3. Good Lighting for Offices and Office Buildings. Frankfurt/M: Fördergemeinschaft Gutes Licht, 1992.

4. Handbook of Environmental Psychology and Quality of Life Research. SPRINGER, 2018.

5. Kamarulzaman, N., A.A. Saleh, S.Z. Hashim, H. Hashim, and A.A. Abdul-Ghani. "An Overview of the Influence of Physical Office Environments towards Employee." Procedia Engineering 20 (2011): 262–68. https://doi.org/10.1016/j.proeng.2011.11.164.

6. Phillips, Denis Charles, and Nicholas C. Burbules. Postpositivism and Educational Research. Lanham, MD: Rowman & Littlefield, 2000.

7. Pile, John F. Color in Interior Design. New York: McGraw-Hill, 1997.

8. Poldma, Tiiu. "Learning the Dynamic Processes of Color and Light in Interior Design." Journal of Interior Design 34, no. 2 (2009): 19–33. https://doi.org/10.1111/j.1939-1668.2008.01017.x.

9. Raanaas, Ruth K., Katinka Horgen Evensen, Debra Rich, Gunn Sjøstrøm, and Grete Patil. "Benefits of Indoor Plants on Attention Capacity in an Office Setting." Journal of Environmental Psychology 31, no. 1 (2011): 99–105. https://doi.org/10.1016/j.jenvp.2010.11.005.

10. Seiferlein, Werner. The Networked Health-Relevant Factors for Office Buildings. Springer International Publishing, 2020.

11. Seligman, Martin. "Perma and the Building Blocks of Well-Being." The Journal of Positive Psychology 13, no. 4 (2018): 333–35. https://doi.org/10.1080/17439760.2018.1437466.

12. Sello, Hope. "Factors influencing adoption of business-to-customer e-commerce". VUT students. ,2019.

13. Shen, Yu-Chuan, Wu-Hsiung Yuan, Wen-Hsing Hsu, and Yung-Sheng Chen. "Color Selection in the Consideration of Color Harmony for Interior Design." Color Research & Application 25, no. 1 (2000): 20–31. https://doi.org/10.1002/(sici)1520-6378(200002)25:1<20::aid-col4>3.0.co;2-5.

14. Silverman, David. Qualitative Research. London: Sage Publications Ltd, 2011.

15. Strauss, Anselm Leonard, and Juliet Corbin. Basics of Qualitative Research. Los Angeles; London; New Delhi: SAGE Publications, 2008.

### ELECTRONIC WEBSITE

16. "Alternative Technology Client Offices - Austin | Office" https://officesnapshots.com/2020/06/22/alternative-technology-client-offices-austin/.

17. "Business Case for Sustainability Presentation." SlideShare. https://www.slideshare.net/LauraLDunkley/business-case-for-sustainability-presentation.

18. "Color and Visual Comfort - University of Texas at Austin ...". https://soa.utexas.edu/sites/default/disk/urban_ecosystems/urban_ecosystems/09_03_fa_kwallek_riosvelasco_ml.pdf.

19. "Daylighting Guide - New Buildings Institute," 2015. https://newbuildings.org/wp-content/uploads/2015/12/DaylightingGuideOfficeInteriors.pdf.

20. "Research in Education (10th Edition): Best, John W., Kahn ..." https://www.amazon.com/Research-Education-10th-John-Best/dp/0205458408.

21. "Social Science Research: Principles, Methods, and Practices." https://digitalcommons.usf.edu/cgi/viewcontent.cgi?article=1002&context=oa_textbooks.

22. Luckwaldt, Jen Hubley. "What Does the Perfect Office Look like? [Infographic]." Payscale, October 14, 2021. https://www.payscale.com/career-advice/what-does-the-perfect-office-look-like-infographic/.

23. Mcleod, Saul. "Questionnaire: Definition, Examples, Design and Types." Questionnaire: Definition, Examples, Design and Types | Simply Psychology. https://www.simplypsychology.org/questionnaires.html.

24. Rima Sabina Aouf |5 February 2017 Leave a comment. "Morag Myerscough Brightens the Wards of Sheffield Children's Hospital." Dezeen, June 25, 2021. https://www.dezeen.com/2017/02/05/morag-myerscough-bright-colour-wards-sheffield-childrens-hospital-interiors-uk/?amp%3Bamp%3Bamp%3Bamp.

## APPENDIX

**Morag Myerscough** is a London-based artist whose work is characterized by an engaging boldness, creating specific, local responses to each distinct audience that will see and experience the work, using it to create community and build identity.

**Martin Elias Peter Seligman** is an American psychologist, educator, and author of self-help books. Seligman is a strong promoter within the scientific community of his theories of positive psychology and of well-being. His theory of learned helplessness is popular among scientific and clinical psychologists. A Review of General Psychology survey, published in 2002, ranked Seligman as the 31st most cited psychologist of the 20th century.