Influence of Employees' Perceptions of Colour Preferences on Productivity in Malaysian Office Buildings

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Abstract

In the Malaysian context, the designers of many office buildings are largely unaware of the effect of colour in the working environment. The choice of colours is made without further study of the problems that might arise from unsuitable colour choices. Employers should therefore be advised to improve the surroundings of the office in order to meet the needs and comfort of the employees.

This study was conducted to enhance the awareness of both the building users and the facility managers on the importance of colour schemes in productivity. Three case study buildings were chosen, consisting of three office buildings in the capital city of Malaysia. Questionnaires were distributed in each case study and feedback from the respondents was gathered. This data was then analyzed and the findings are presented.

In Malaysia nowadays, there is a lack of awareness about the preference of colour schemes for office buildings. Many are unaware of the effect of the colour scheme on the employees' productivity. It is anticipated that this study will enhance the awareness and encourage the correlation between the working environment and colour matters amongst building users and management.

Keywords: Awareness, Colour scheme, Productivity and Office buildings

1. Introduction

Colour is a visual phenomenon triggered by the response to the stimulation of light. It pervades every aspect of our lives, embellishes the ordinary and gives beauty and drama to everyday objects (Holtzschue, 2002). Colours also affect psychological aspects of the building's occupants. Some colours provide calmness, some provide comfort, some are stimulating and many others have an impact in different ways. This means that colour will affect the mood of the occupant of the space. So, appropriate colour should be chosen to ensure the mood of the employees is good in order to encourage productivity. According to Wallis (1995), whether the mood is to be big, bold and daring, or personal, restrained and relaxed, there are a host of very different colour, lighting and furniture schemes which could be used, with both emotional and functional impact. Colours and surfaces similarly can change an office dramatically.

Productivity is rarely correlated with colour. However, the colour scheme does play an important role in the working environment. Nowadays, in the Malaysian context, many are unaware of the effect of colour choice in planning a workspace, although in other countries studies on colour schemes are conducted in offices to enhance productivity and also to meet the needs and comfort of the building's occupants.

According to Garris and Monroe (2005), with most workers now spending hours on computers each day, the constant viewing of brightly coloured screens creates the need for softer, more restful colours that simplify physical surroundings. Some research into the colour preferences of office workers has found that many people associate white with blankness, emptiness, boredom and depression (Pile, 1997). Thus the colour scheme chosen must be made with proper consideration to produce better quality of work. If unsuitable colours are chosen, occupants might be subject to negative psychological impacts such as stress, depression, dullness or boredom.

Consideration of colour to improve productivity should be made with proper guidance. However, this aspect is still not entertained in most offices in Malaysia. Thus, this research aims to enhance the awareness of both building users and the facility managers of the importance of colour schemes in productivity at work.

2. Theory and Psychology of Colour

Colour is an aspect caused by differing qualities of the light reflected or emitted from them, definable in terms of the observer or of the light. Ragan (1995) points out that the first attribute of colour is its name, known as hue. Furthermore, chroma is the intensity of colour, determined by the amount of grey added to it (Ragan, 1995). In addition, on the chroma scale, only the intensity of colour varies but not its value. Ching (1995) defines colour as a phenomenon of light and visual perception that may be described in terms of an individual's perception of hue,

saturation and lightness for objects, and hue, saturation and brightness for light sources. Jones (1937) stated that colour is technically hue, as distinct from chroma (the purity of a colour) and colour value (the component greyness amount). Furthermore, Porter and Mikellides (1976) claim that the sensory message reaching our eyes is not a colour experience until it reaches the brain.

Colours in the office workplaces are very important to ensure efficiency in the working environment. As shown in Table 1, office colour schemes will have an effect on the employees, especially on psychological aspects. Dorgan (1994) defines productivity as increased functional and organizational output including quality. There is general agreement that improved working conditions and the office environment is certainly one of the more important working conditions, tending to increase productivity. According to Farshchi and Fisher (1997), the character of space affects human emotions and behaviour. In space configuration or arrangement, colour also plays an important role in influencing either large or small areas. For instance, a long, narrow room can be made to seem more normal if the end walls are painted in warm, deep and intense colours, while the side walls are painted in lighter, less saturated colours. A low ceiling will seem less oppressive if its colour is light while a high ceiling can be made to seem lower by a dark blue, grey or black (Pile, 1997). If two rooms of the same size are compared, the room with the darker colour scheme will appear to be smaller than the other room with a lighter colour scheme. Acking and Kuller (1968) stated that spaciousness increases as lightness increases; spaciousness increases if chromatic strength increases; and complexity increases as chromatic strength increases. According to Leonardo Da Vinci's manuscripts, cited in Porter and Mikellides (1976), a dark object seen against a light background will seem smaller than it is and a light object will appear greater in size when it is seen against a background that is darker in colour.

There is also interaction between colour and distance. Porter and Mikellides (1976) indicate that a lighter object appears to be nearer and larger than a darker object of the same size and perceived at the same physical distance. Most perceptions occur unconsciously and at such high speed that they seem simultaneous with sensation (Rodemann, 1999).

3. Correlation Between Colour and Productivity

Clements-Croome (2000) states that productivity depends on four cardinal aspects: personal, social, organizational and environmental. Furthermore, not only should indoor air quality and thermal comfort be taken into consideration, but also the quality of lighting, sound levels, layout of individual workspaces, colour schemes, materials, indoor carbon dioxide concentration, radiation and electromagnet fields, dust levels and biological contaminants.

In order to comply with the workers' comfort, they should be asked their preferred choice of colour. Getting input from the workforce increases their involvement and ownership, which should positively impact productivity (Kennedy & Hart, 2004). According to Bette (1996), jobs that require great concentration require a neutral colour scheme, jobs like those of accountants and attorneys require stronger a colour scheme, while journalists would perform best in exciting and energetic colours with great contrast value. Sogawa et al. (2002) agree that the interior workplace should be designed to consider workers' needs, resulting in positive changes in productivity of the workforce. The elements to be considered include the layout of the workspace, materials used, lighting system, air quality, furniture, fixtures, furnishings, sign planning, colour planning and operation and maintenance. Garris and Monroe (2005) state that colour influences not only mood but also wellness and productivity. Bette (1996) indicates that people's reactions to different colour schemes depend on their culture, education, genetics and socio-economic level. As a result, behavior and productivity in the workplace are heavily influenced by space, structure, colour, lighting and activity.

Each colour has different effects on the human body. Everyone experiences colour in their own personal way. There should be appropriate colour choices in the office workplace so that the quality and productivity of work are well maintained. Thus, there must be awareness leading to differentiate the colours that will improve or reduce the productivity of work. According to O'Brien (2007), a blue office is ideal for someone who must focus and concentrate on numbers, green is a great choice for a management office as it has a balancing effect, and yellow is suitable for sales offices. Kotler (1973) indicates that atmospheric phenomena such as noise, sizes, shapes, scents and colour could help create attention, convey messages and create feelings that might increase purchase probability. These effects have been demonstrated to influence emotional responses and behavioural intentions (Alpert & Alpert, 1986).

It is clear that colour assists in creating attention. This is crucial for workers especially in performing work. Without concentration and attention, the work done will be low in quality and productivity.

4. Methodology/Data Gathering

A mixed method approach of quantitative and qualitative research was adopted. A questionnaire survey method and semi-structured interviews were employed as the data collection instrument. The survey was carried out in three office buildings in Peninsular Malaysia. Each building is owned by a public listed company with a high corporate reputation in Malaysia.

Questionnaires were distributed to all the building case studies through their Departments of Human Resources. The number of respondents for each building was 50 people. The questionnaires were given to the person in charge to be distributed and was collected within a week. There are three sections in the questionnaire: general information, users' satisfaction and users' point of view. General information asked about age, gender, race, job, work experience and any colour vision deficiency. The questions in the second part of the questionnaire, are on comfort at work, comfort with the colour scheme, the effect of the colour scheme and its relation to productivity. The third part asked about preference of colour scheme, favourite colour, colour group preferred and relationship of colour scheme to corporate image.

Interviews were also conducted with the building managers of all the three case studies, to add more information about the use of colour within that building. General information about the building, the maintenance and person involved in the use and choice of colour scheme for each building was also gathered during the interview sessions. This paper presents only significant points from the survey representing the overall findings.

5. Analysis of Results

Table 2 presents the number of respondents to the questionnaire survey. Out of 50 questionnaires distributed to each building, 22 were returned for Building A, 47 for Building B, and 36 from Building C; response rates were respectively 44%, 94% and 70%.

5.1 Section A Results

The first part of the questionnaire is about the background of the respondents: age, gender, race, job, work experience and any colour vision deficiency. The general information from the three case studies, is gathered together for easier comparison.

As shown in Figure 1, 51.9% of the respondents from Building A were aged 21-30, 27.3% 31-40 and 13.6% 41-50. The resepctive figures for Building B were 70.2%, 27.7% and 2.1%, and for Building C, 66.7%, 30.6% and finally 2.8%.

Figure 2 shows data on gender: in Building A, 27.3% of respondents were male, in Building B 68.1% and in Building C 63.9%.

Figure 3 show that most of the respondents in Building A work in clerical grades (63.6%), followed by 13.6% in managerial and other jobs, and 9.1% in professional jobs. The figures for Building B are 57.4% in managerial tasks, followed by professionals with 34%, and both clerical and others with 4.3%. In Building C, most of the respondents (77.8%) are professionals; followed by 19.4% in other jobs, and finally 2.8% are clerical staff.

As illustrated in Figure 4, Building A has the highest percentage of respondents with experience of 0-5 years (63.6%), followed by 11-15 years (18.2%), 6-10 years (13.6%) and above 15 years (4.5%). As for Building B, 72.3% of respondents have experience ranging 6-10 years, followed by 14.9% with 11-15 years and 12.8% with 0-5 years. For Building C, 63.9% of respondents have experience of 0-5 years, followed by 25% with 6-10 years, and 5.6% for both the 11-15 and above 15 years groups.

None of the respondents have any problems with colour vision.

5.2 Section B Results

The second part of the questionnaire is about the users' satisfaction with the building conditions and the service provided. The questions required the respondents to choose answers from the range of1-5, with 1 representing strongly disagree, 2 disagree, 3 moderate, 4 agree and 5 strongly agree.

Figure 5 below shows that 45.5% of respondents expressed agreement that their workplace is comfortable and most of the respondents (63.6%) felt moderate satisfaction with the colour scheme available. This clearly indicates that all three buildings are considered to be employing good colour schemes. The colour is a neutral scheme. Furthermore, more than half of the respondents (68.2%) strongly agreed that the colour scheme is closely related to productivity. 27.3% of respondents that expressed moderate agreement, 4.5% strongly agreed and none of them disagreed with the statement. This means that the workers are aware of the importance of the colour scheme towards productivity of conducting work.

5.3 Section C Results

Figure 6 shows that the favourite colour of the highest number of respondents is blue (40%), followed by red and black with 15% each, green and white with 10% each and lastly pink and purple with 5% each. This clearly shows that the colour preference for most of the respondents for office interiors is blue; this matched the findings from the literature review, which stated that blue is the most suitable colour for office interiors because its characteristics suggest calm, freshness, harmony and ease.

Blue was been chosen as the colour that supports many psychological aspects of the employee. Referring to Figure 7, the highest number of respondents' chose blue (33%) and green (32%), followed by black, white and purple with 10% each and finally yellow with 5%. This suggests a preference by the respondents to choose blue as the colour to increase energy at work and as a medium to soothe feelings of stress.

Most of the respondents were comfortable with the condition and colour scheme of their office. It can be seen from Figure 8 that 30% stated that the colour scheme provided makes them feel happy, while 26% felt energized by the colour chosen. Nevertheless, 26% felt dull or bored, followed by 13% feeling distracted or given sore eyes, and 5% feeling sad. It is believed that the rate for dull or bored is largely due to the neutral tone of the colour scheme (cream and white) without introducing some bright colours.

6. Discussion of Findings

The colour schemes used in all the case study office buildings were considered as good because the colours blend together nicely between the wall, furniture and floor finish. The colour scheme used is also neutral but there is a mixture of cool colour, blue, that helps enliven the condition of the offices.

Most of the respondents were satisfied with the colour scheme and condition of the office. In addition, many responses stated that the colour scheme used currently is energizing.

The statement that the colour scheme is closely related to productivity at work is agreed with by most of the respondents. With surroundings that give light, calmness and comfort to the user, the productivity will be enhanced.

It is interesting to note that the colour most favoured by the respondents was blue, followed by grey and yellow. According to Khouw (1995), yellow has a higher affective value for men than women. Thus, the second favourite colour of yellow was due to the percentage of males being higher than females in all buildings.

6.1 The system and behaviour of colour

Based on the methodologies conducted to find out the system of colour and its behaviour, it is concluded that different people have different approaches towards colour perception. This may be seen through the colour preferences made by the respondents through the questionnaire. Basically, most of the respondents within the three case studies chose blue as their favourite colour, besides identifying it as a colour that increases energy to work and is also soothing and calming. The behaviour of colour may be analyzed through the effect it provides on the building user, besides conducting observation on the effect of the colour scheme on the space itself. The effect of colour on the users was measured through evaluation of the users' satisfaction. More consideration should be given to choosing the colour scheme, so that the effects of colour on office users blends with the work being done there.

6.2 The provision of colour scheme and employees' productivity

One of the weaknesses is that no guidelines have been used in order to determine the colour scheme for offices in Malaysia. By referring to the case studies, it is suggested that some colour schemes have a negative impact on the respondents. For instance, a dull or distracting colour scheme in an office cause the workers to feel bored or tired, due to their dislike of the surrounding colour scheme in the wall, furniture and floor, as used in Building C.

If the time spent in the workspace increases, the workers will lose concentration and this will then lead to the decline of productivity itself. In addition, if the work requires a lot of time using the computer, an unsuitable colour scheme will result in sore eyes, and the productivity of workers will decrease, because of their discomfort. From observation conducted during the three case studies, all the workers are required to work with computers. Therefore, the colour scheme used must be suitable and soothe the feelings of the workers in order to rest their eyes.

In order to select the most appropriate colour scheme, there should be discussion between the office users about their colour preference for the scheme, in order to enhance productivity.

6.3 The current trends of colour scheme preference for office interiors

The case studies also revealed that there are offices that choose a colour scheme based on their corporate image's colour (Building B); another depends on the developer (Building A) and another on the remaining stock available after painting work done elsewhere (Building C). Most of the offices studied had chosen neutral colour schemes for the office, but with the addition of a cool colour such as blue.

One office has a multicolour scheme where the colours do not blend with each other, causing conflict between the colours used. However, there is also an office with a colour scheme that mixes and blends together the colours of the wall, floor and furniture.

In order to improve the choice of colour in an office, appropriate guidelines should be produced to identify and ensure that the wall colour matches the colour of the furniture and floor finishes. As long as the chosen colours blend together, the condition of the office will be upgraded.

7. Conclusion

The colour scheme is a crucial aspect of the design and space planning of an office. The choice of colour scheme requires planning and consideration of the effect of colour on the building user and the system of colour should be identified. From the research conducted, it can be concluded that offices in Malaysia still lack awareness in choosing a colour scheme that is suitable for an office. It was identified that most of the offices do not provide a very comfortable colour scheme for the workers; many respondents were not satisfied with the approach of using

neutral colours without the addition of stimulating colours to energize them and to increase work productivity. In addition, the choice of materials for furniture in some offices is made without referring to the previous furniture, when increasing the workspace for new workers. If the new furniture has a different colour scheme to be added in, this leads to sore eyes, besides reflecting that the office is using an unsystematic approach.

The current office scenario in Malaysia, that places little emphasis on the colour scheme, is also minimal due to neglecting to study the characteristics of colour and its effect on the user. Through the case study it was found that none of the buildings has any guidelines for colour schemes, although there are offices that have taken the initiative of implementing the corporate colour to symbolize the company's image. This is one of the approaches that are quite relevant, but appropriate guidelines are still needed to refer to in the case of changes or renovation in the office workspace.

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Table 1. Psychological Impact of Colour (Source: Porter & Mikellides, 1976; Wright, 2007)

Hue	Effect	Description
Red	Exciting	- An emphatic colour - Signifies danger and romance - Increases rate of respiration and raises blood pressure - Makes people hungry - Grabs people's attention - Excitement and strength - Courage and conviction
Blue	• Relaxing • Retiring	- Associated with sky and ocean - Calming, expansive and cool - Helps in deep concentration - Comfort and ease - Slows heart rate, suppresses hunger and reduces blood pressure - Harmony and truthfulness - Appears fresh and unpretentious
Yellow	Cheering	- Most reflective, perceived quickly - Increases cardiopulmonary activity - Cheer, mild stimulation, open, expansive - Wealth, intelligence, attention getter - Cowardice, weakness - Spiritual enlightenment
Green	• Relaxing • Retiring	- Symbolic of life, fertility and rebirth - Relaxes people, good for speech development, good for meditation - Natural colours of grass and trees - Calming and restful to eyes - "Go" signal - Filtering out distraction
Purple	Subduing	- Good for inner thought - Mystical, threatening (deep) - Magical, playful, light (pale) - Luxury, grandeur
Orange	Stimulating	- Happy commercial implications - Restful, earthy, natural, soothing - Radiant, glowing, balanced - Excitement, fire, danger, heat
Brown	Depressing	- Calm, comforting, simple - Depressive, drab - Poverty, nature, stability
White	Neutralizing	- Purity, blankness, boredom - Simplicity, clarity, refreshing, clean - Hope, air, open, spacious feeling - Strain on eyes
Black	Depressing	- Classic - Strength, seriousness, dignity - Depression, fear - Mysterious, sorrowful, mourning - Evil
Grey	• Neutralizing • Retiring	- Neutral - Ominous, depressive - Strong emotions - Respect, stability - Rarely offensive

Table 2. Summary of respondents' feedback

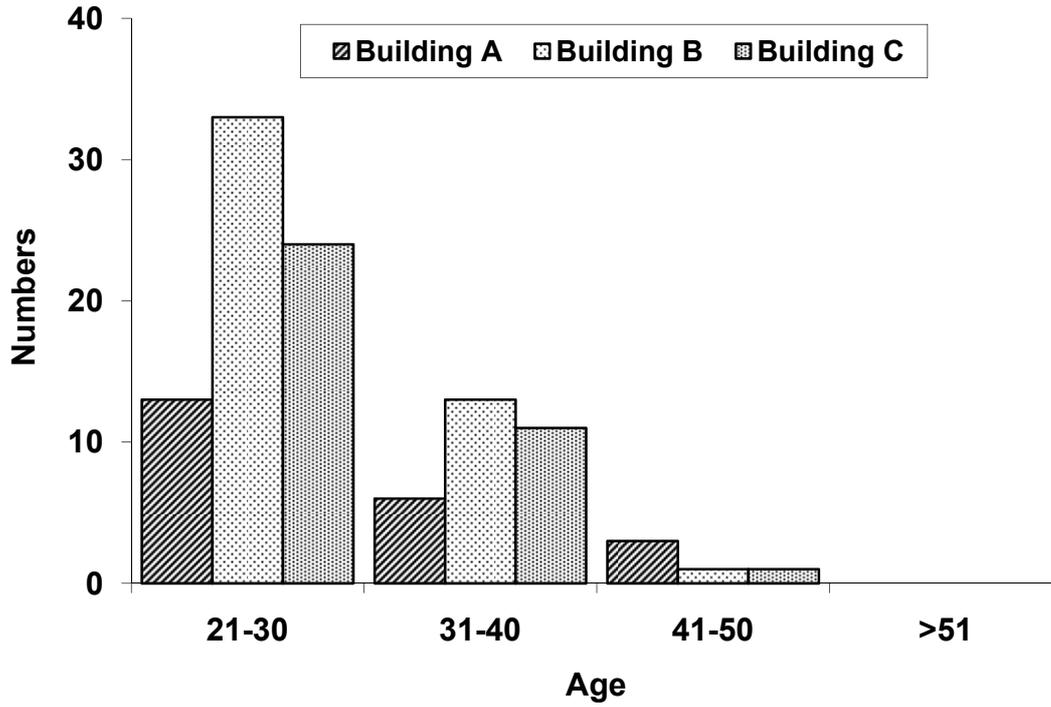|	
Total Questionnaires Sent Out	150
Total Questionnaires Replied	105
Total Questionnaires Rejected	45
Valid Response Rate	**70%**

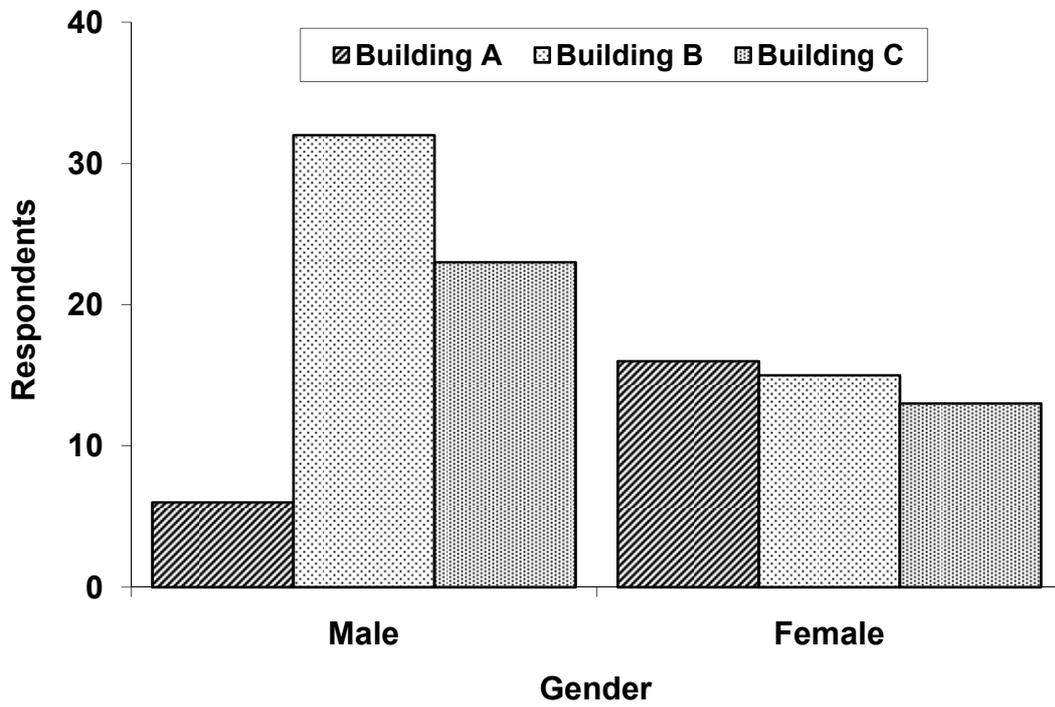Figure 1. Distribution of respondents by age
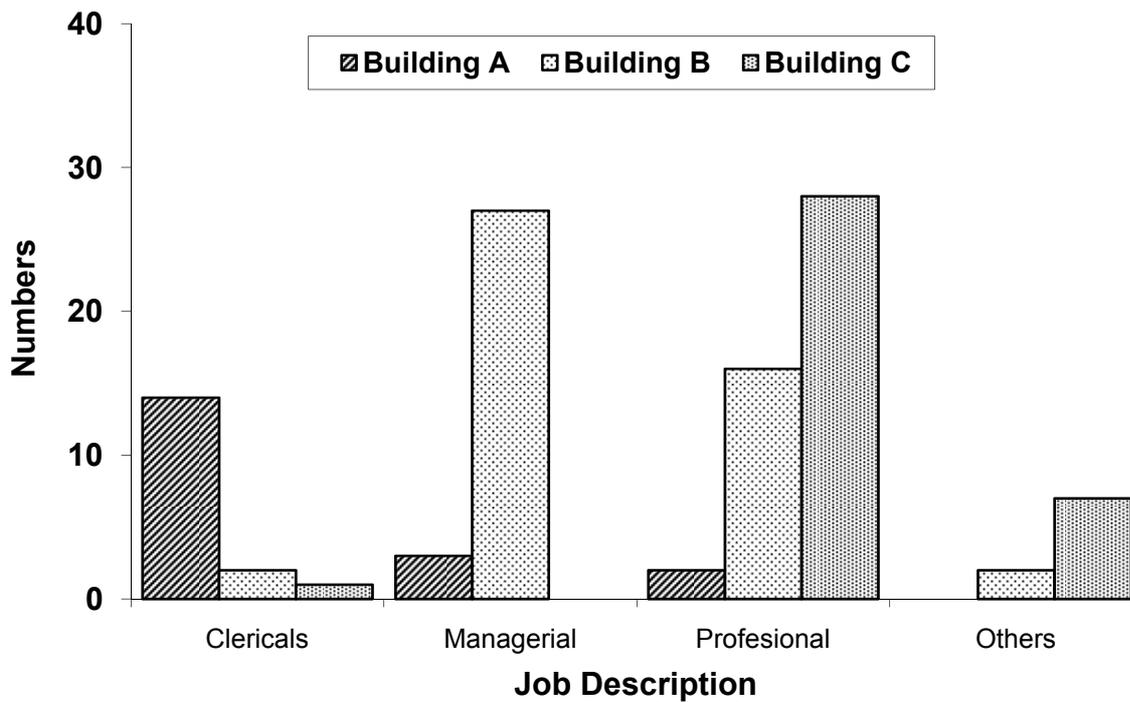
Figure 2. Distribution of respondents by gender

Figure 3. Distribution of respondents by job

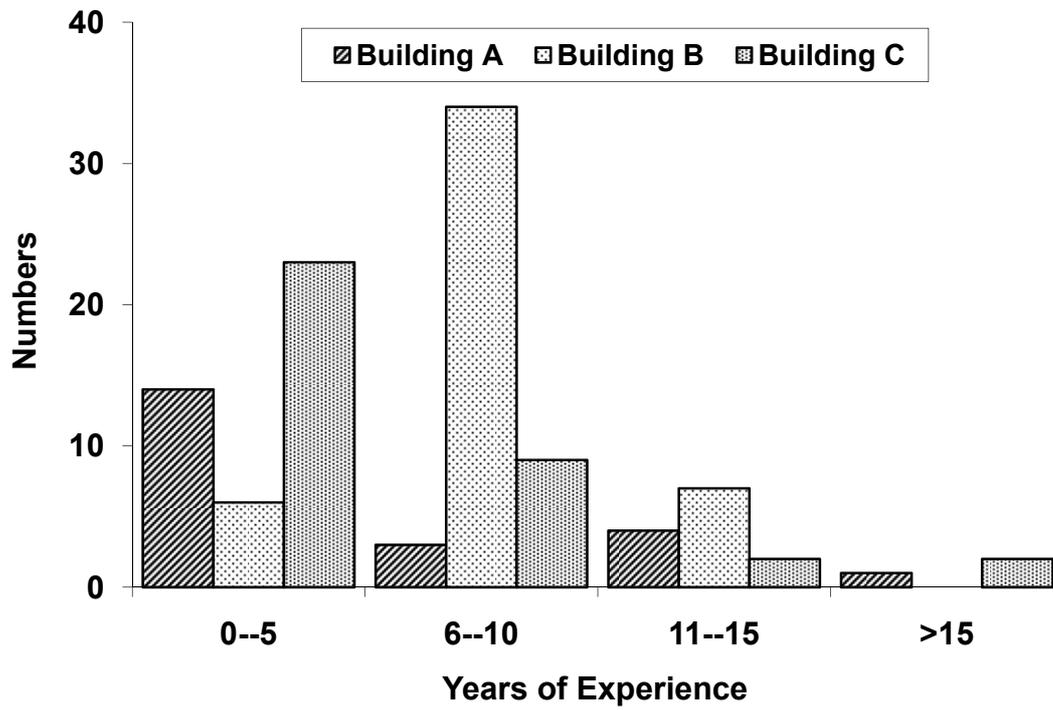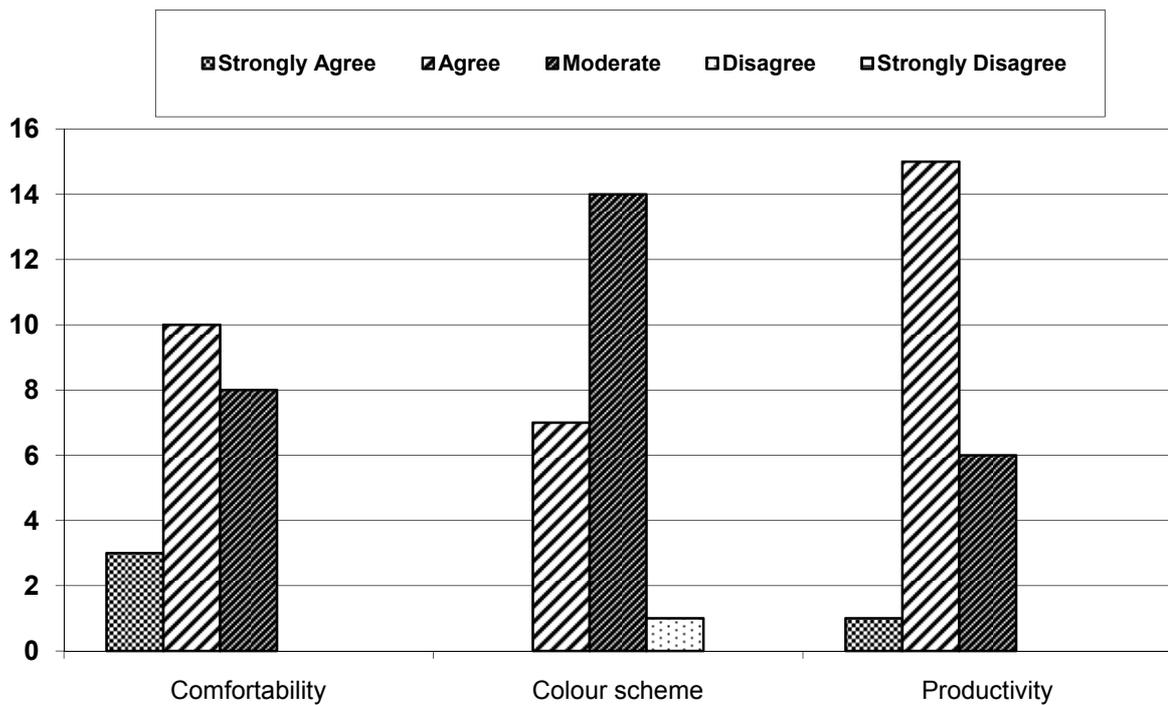Figure 4. Distribution of respondents by work experience

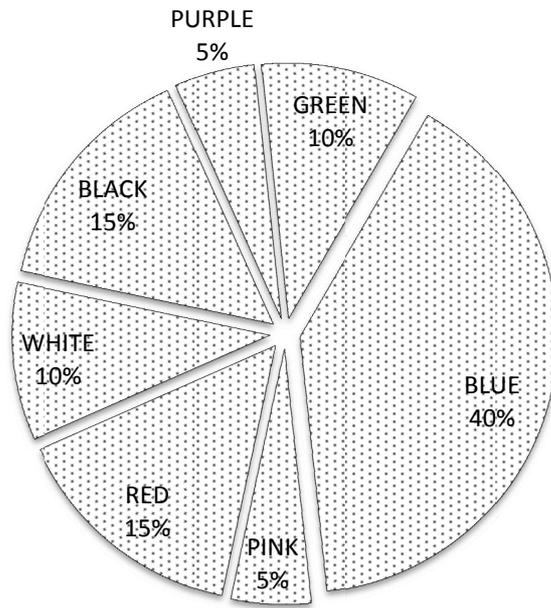Figure 5. Respondents' feedback on comfort, colour scheme and productivity

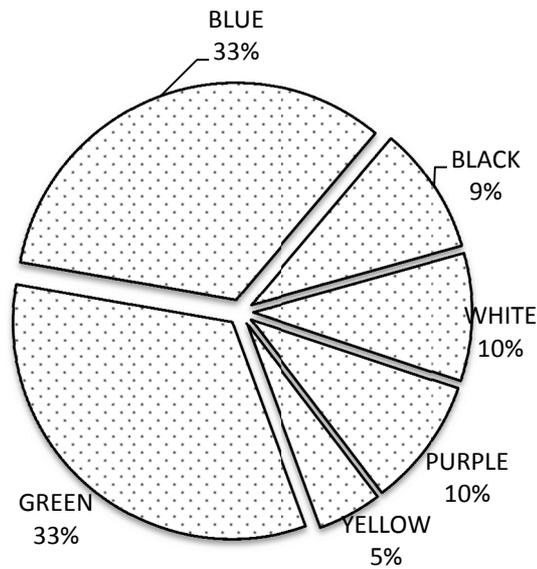Figure 6. Respondents' favourite colour

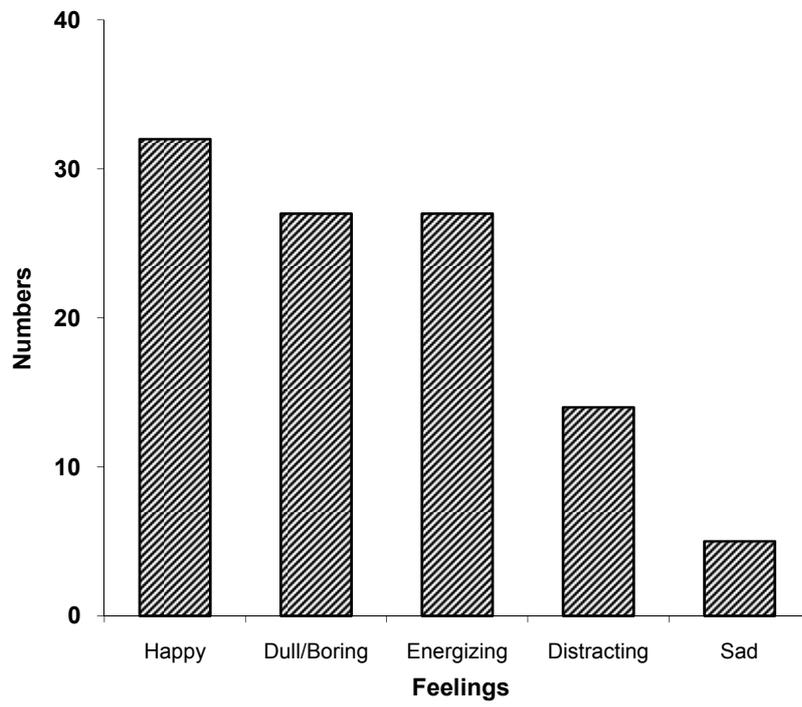Figure 7. Respondents' response on colour that soothes and calms tension

Figure 8. Respondents' feelings about the colour scheme of their area