

## **Effect of Scents and Interior Colors on Learning Motivation**

Fajarsani Retno Palupi\*, Prabu Wardhono, Yannes Martinus Pasaribu

<sup>1</sup>*School of Creative Industries, Telkom University, jln. Telekomunikasi, Bandung, Indonesia*

<sup>2</sup>*Faculty of Art and Design, Bandung Institute of Technology, Ganesa 10, Bandung 40132, Indonesia,*

<sup>3</sup>*Faculty of Art and Design, Bandung Institute of Technology, Ganesa 10, Bandung 40132, Indonesia,*

### **Abstract**

Acquiring knowledge are one of the most important motivation people are usually driven to do. In fact, people need for motivation as a driver to do any sort of tasks. Green color and scent for interiors can bring a positive impact on the psychological condition of an individual. From the Anova analysis, the room dominated by a higher concentration of pastel green color and lemon scent stimulated responses most positively toward learning motivation. In the future, we expect that further exploration could be carried on to enhance the science of design and support the development of related industry.

**Keyword:** color, scent, learning motivation, learning environment.

### **1. Introduction**

#### **1.1 Reading: A Way to Obtain Information**

Reading is the basic of learning, and it becomes the foundation in learning (Tilaar in sugihartati, 2010). By reading information from books we can understand the content. Unfortunately, reading as supporting activity in education, particularly reading scientific texts is not considered important in Indonesia. It can be seen from the following data: The percentage of Indonesian people over the age of 15 . . . who read school textbooks is 44.28%, and who read other science books is only 21.07%. Furthermore, the percentage of Indonesian people who do reading to get information is only 23.5% of the total population, while the ideal reading interest should be 80% of the total population (Majid, 2012). Other studies have also pointed out that only about 10% of the total children in Indonesia like reading, and the rest belongs to the group who are reluctant to read (Sugihartanti, 2010). From the description, it shows that there is a very long gap between the reading interest in Indonesia. A survey states that Indonesian students interest in reading is among the lowest. Of the 42 countries surveyed, Indonesian students' reading interest is ranked the 39th, above Albania and Peru (edukasi.kompas.com, 2011).

One of the causes for the reluctance to read is due to the negative image attached to library by the society. Library is viewed as an old-fashioned or outdated place (Rahmadhani, 2011), whereas it has an important role, as the source of knowledge that is needed by students. Especially in the open information era, there are many emerging sources of knowledge that continue to be updated. In relation to the above facts, a study has found that the learning or reading environment can be manipulated in such a way that it can increase the reading motivation. Motivation plays an important role as a "driving force" of individual behavior (Uno, 2011). Motivation plays an

important role in influencing the individual to learn as much as 72.62% (Wiyono, 2003). Factors that can affect motivation to learn are the quality of lecturers, the subject workloads, the condition and atmosphere of the lecture hall and the library facilities (Pujadi, 2007).

**2. Research Methods**

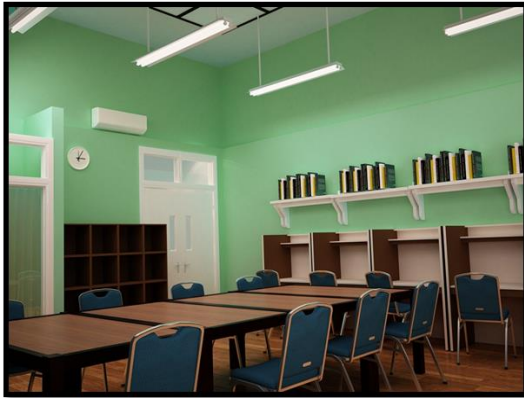
This study uses experimental research method because the researchers would like to see the phenomenon that will occur or that is happening when the condition of the room is given special treatment, such as providing scent and color as stimuli. Those stimuli will be manipulated to find a combination that is effective to help students study. It is in line with Sugiyono’s idea (2011); he explains that experimental research study is used to investigate the influence of specific treatment for a condition other than a condition that has been controlled.

Stimulus that will be used in this research is in the form of 3-dimensional digital images that describe the condition of a reading room with all the interior fittings that are designed based on the consideration of the foundation of the theory of an ideal library reading room. Then, these images will be visualized through a projector and respondents will give their response. The room model will be used to analyze three aspects: perceptions, emotions and encouragement to read. The researchers arrange room conditioning using combination of two variables: color and scent. Scent and color that are used each consists of two kinds. Therefore, the stimulus model will be developed into 2 x 2 = 4 reading room condition, namely:

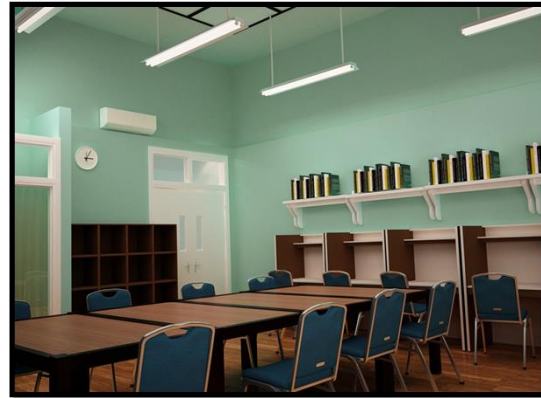
**Table 1.** Combination of Experiment Room Conditioning (source: researchers, 2012)

<b>scent</b> <b>color</b>	Scent 1 ( <i>rosemary</i> )	Scent 2 ( <i>lemon</i> )
Color 1 ( <i>Pastel green</i> )	<i>Pastel green, rosemary</i>	<i>Pastel green, lemon</i>
Color 2 ( <i>Pastel green satin</i> )	<i>Pastel green satin, rosemary</i>	<i>Pastel green satin, lemon</i>

The four combinations of the conditioning room are then tested alternately. Respondents participating in this research are undergraduate students, aged between 18-22 years old. This research uses *purposive sampling* and *convenience sampling*, ie sampling based on certain things. This research analyzes the reading room designed as library reading room. Accordingly, the sample of this research is students who have ever visited university library. All of the respondents must feel the four conditioning, so that the results obtained will be the most positive, based on comparison of the conditions that they felt during experiment. On the first stage, the respondents will enter into a room with lemon scent and images of conditioning reading room or study room in green satin. After 5 minutes, the display is changed into pastel green satin. The same procedure is applied for rosemary scent. It has been mentioned that the respondents will respond to the condition of a reading room, which is visualized in 3-dimensional image. To clarify, the 3-dimensional images used in the experiment are shown below;



**Figure 1.** Simulation Using Pastel Green Stimulus Reading Room Interior  
 (Source: Researchers, 2012)



**Figure 2.** Simulation Using Pastel Green Stimulus Reading Room Interior  
 (Source: Researchers, 2012)

### 3. Experiment Results

From the ANOVA calculation, green with higher intensity (pastel green) gets good response from the students, particularly in condition where pastel green and lemon are combined. The good response can result from the different intensity of colors. Respondents tend to choose light green with a higher intensity of color (pastel green). The result is in line with Mahnke's opinion (1987), which explains that the use of green is very effective when it is used in rooms where people need a lot of concentration as in library as a place to read books. On the contrary, green with low intensity (pastel green satin) is not a favorite, because it looks more bluish. Mahnke (1987) explains that pale blue gives bleak and cold effect. The calculation done by the researchers proves that green with higher intensity can attract students' interest in coming and reading in the library (Augustin, 2009).

Similar to the results obtained in color stimulus experiment, the scent stimulus that has the highest response is the combination of pastel green and lemon. The scent used is lemon fragrance (fruit fragrance). There is a possibility that the different response scoring is influenced by the intensity of scent spread in the room. Rosemary fragrance has a lower concentration than lemon fragrance although the number of drops was added. In the experiment, there were 21 respondents, consisting of men and women. Gender may influence the preference and choice for certain kind of scent. Lemon fragrance has high response score because it is a fruit fragrance. Fruit fragrance is liked by both men and women. That is why lemon scent gets a more positive response than rosemary scent (Augustin, 2009). Lemon scent is rated better because of the effect it produces. When the respondents were in the room with lemon scent, their mood to do activities increased more significantly than when they were in the room with rosemary scent (Augustin, 2009).

**Table 2.** Interaction Effect on Students’ Response (Source: Researchers, 2012)

Condition		Attitude					
		Perception respond		Emotion Respond		Conation Respond	
1	2	Not significant	-	Not significant	-	Not significant	-
	3	Significant	+	Significant	+	Significant	+
	4	Not significant	+	Not significant	+	Not significant	+
2	3	Significant	+	Significant	+	Significant	+
	4	Significant	+	Significant	+	Not significant	+
3	4	Not significant	-	Not significant	-	Not significant	-

Description: (+): an increase in the scoring of the response, (-): a decrease in the scoring of the response

Description:

- Condition 1 : pastel green, rosemary
- Condition 2 : pastel green satin, rosemary
- Condition 3 : pastel green, lemon
- Condition 4 : pastel green satin, lemon

From the table above, it can be seen that cognitive components (perception), affective components (emotion) and impulsive behavior components have a tendency to respond in the same way. It can be seen from the result of the Mean Difference of each response. The difference is only at the significance level. Although the same treatment is given to each respondent, the sensitivity of human senses of each individual is not the same (Augustin, 2009). The combination of these three components will form a behavior. The discussion of the above table can be described as below;

1. Comparison between Condition 1 and Condition 2

The three responses; perception, emotion and cognitive behavior showed similar insignificant result. These two conditions The three responses; perception, emotion and cognitive behavior showed similar result the same scent of rosemary, but different color. The first condition used pastel green color, and the second condition used pastel green satin. After the respondents responded to the first and continued to the second condition, there was a decrease in the response score. It means that the first condition is responded more positively than the second condition. It

depends on the intensity of color used. The first condition has higher color intensity because green is suitable to be used in rooms that require the users to perform concentration (Mahnke, 1987).

## 2. Comparison between Condition 1 and Condition 3

The three responses; perception, emotion and cognitive behavior showed similar significant result. The color used by these two conditions was pastel green, but the scents were different. The first condition used rosemary scent, and the third condition used lemon scent. After the respondents responded to the first and continued to the third condition, there was an increase in response score. It means that the third condition is responded more positively than the first condition. The third condition used a combination of color and scent stimulus that have the highest intensity; green and lemon. Fruit fragrance is responded well by both sexes (Augustin, 2009).

## 3. Comparison between Condition 1 and Condition 4

The three responses; perception, emotion and cognitive behavior showed similar insignificant result. Each condition used different combination; the first condition used pastel green and rosemary scent, and the fourth condition used pastel green satin and lemon scent. After the respondents responded to the first and continued to the fourth condition, there was an increase in response score. It means that the fourth condition is responded more positively than the first condition. The respondents felt the difference and it was also shown by the increase in the response score although the increase was not significant. The increase of the response score is influenced by the kind of scent used. The fourth condition that is responded more positively used lemon scent which is responded well by both sexes. (Augustin, 2009).

## 4. Comparison between Condition 2 and Condition 3

The three responses; perception, emotion and cognitive behavior showed similar significant result. Each condition used a different combination; the second condition used pastel green satin and rosemary scent, and the third condition used pastel green and lemon scent. After the respondents responded to the second and continued to the third condition, there was an increase in response score. It means that the third condition is responded more positively than the second condition. The respondents felt the difference and it was also shown by the increase in the response score. The third condition used a combination of both color and scent stimulus that have the highest score; green with high-color intensity and lemon scent. Fruit fragrance is responded well by both sexes (Augustin, 2009).

## 5. Comparison between Condition 2 and Condition 4

Two responses; perceptions and emotions showed similar significant results, while the cognitive response was insignificant. Both conditions used the same color; pastel green satin, but used different fragrance. The second condition used rosemary scent and the fourth condition used lemon scent. Although both responses showed significant result, the cognitive response showed the same response to the given conditions. It might happen because the use of green with low-color intensity is not a favorite option. The color tends to look bluish which suggests bleak and cold impression (Mahnke, 1987). After the respondents responded to the second and continued to

the fourth condition, there was an increase in response score. It means that the fourth condition is responded more positively than the second condition. The fourth condition used lemon scent. Fruit fragrance is responded well by both sexes (Augustin, 2009).

#### 6. Comparison between Condition 3 and Condition 4

The three responses; perception, emotion and cognitive behavior showed similar insignificant result. Both conditions used the same fragrance; lemon, but used different color. The third condition used pastel green and the fourth condition used pastel green satin. After the respondents responded to the third and continued to the fourth condition, there was a decrease in response score. It means that the third condition is responded more positively than the fourth condition. The decrease of the response score is influenced by color intensity used. The third condition used a green room with higher intensity of color, while the fourth condition used a green room with lower intensity of color. Green is suitable to be used in rooms where the users need high concentration, while green with low- color intensity tends to be bluish which suggests bleak and cold impression (Augustin, 2009).

Cognitive theory explains that learning process is not just a stimulus-response, but it is also influenced by perceptions and students' understanding of their learning environment (Soekamto & Winotoputra, 1994). The learning environment can provide a good stimulus for perception process. In other words, learning environment that is designed thoughtfully and maximally can provide a positive perception. Rooms having purpose as a reading area need comfort. According Suptandar (1999), reading activity needs a room that can attract people and where someone can sit comfortably. Learning environment which is well-arranged will give long or continuous -term effect to the learning process (Soekamto & Winotoputro et al, 1994).

Perception cannot be separated from human senses that have function to respond to what is happening in their surrounding. Asir (2011) says that perception is a psychological process that involves sensing, integration, and assessment of the social or physical objects in their social environment. The research involves two senses, nose and eyes. The more senses used to respond to a stimulus, the better (Arslan, 2012).

#### 4. Conclusion

The research is still far from being perfect due to the limitations that the researchers have. The research used two different kinds of scent disseminator due to difficulty in obtaining Rosemary scent spray (the researchers used Rosemary aromatherapy furnace instead). If each scent is spread using the same disseminator, the result is still unknown. The scent intensity also can influence perception. If scents which have the same level of intensity are used, the result is still unknown too.

This research is expected to give a positive impact on the related areas. The results of this research can give contribution to the development of design, and can be a reference for other research about design or other disciplines that are related to human environmental and sciences. It is also expected that this research will encourage the emerging reading space that can attract people to read.

#### References

- [1] Asir, Dzudin Ahmad. Persepsi Mahasiswa Tentang Gaya Mengajar Dosen di Jurusan Pendidikan Teknik Sipil FGTK Universitas Pendidikan Indonesia, **Undergraduate Thesis**, Bandung, UPI, (2011)
- [2] Atmanta, Ignasius Tri Sunarna. Persepsi Pengguna Terhadap Desain Interior Perpustakaan Di Perpustakaan Universitas Atma Jaya Yogyakarta, **Undergraduate Thesis**, Semarang, Diponegoro University, (2010)
- [3] Augustin, Sally. **Place Advantage: Applied Psychology For Interior Architecture**, New Jersey, John Wiley & Sons, Inc, (2009)
- [4] [Mahnke](#), Frank H. & [Mahnke](#), Rudolf H. **Colour And Light In Man-Made Enviroments**, Van Nostrand Reinhold, (1987)
- [5] Pujadi, Arko. Faktor-Faktor yang Mempengaruhi Motivasi Belajar Mahasiswa: Studi Kasus pada Fakultas Ekonomi Universitas Bunda Mulia, **Junal Bunda Maria**, Vol.3, No. 2, p. 40-51.
- [6] Sabri, Tahmid. Memupuk Kemandirian Sebagai Strategi Pengembangan Kepribadian Individu Siswa Dalam Belajar, **Jurnal Pendidikan Sosiologi dan Humaniora**, Vol.1, No.1.
- [7] Shams, Ladan & Seitz, Aaron R. **Benefits of Multisensory Learning. Trends in Cognitive Sciences**, Cel Press, (2008)
- [8] Soekanto, Toeti & Winataputra, Udin Saripudin. **Teori Belajar Dan Model-Model Pembelajaran**, PAU-PPAI, Jakarta, (1994)
- [9] Sugihartati, Rahma. **Membaca, Gaya Hidup dan Kapitalisme: Kajian Tentang Reading for Pleasure dari Perspektif Cultural Studies**, Graha Ilmu, Yogyakarta, (2010)
- [10] Suptandar, Pamudji J. **Desain Interior: Pengantar Merencana Interior Untuk Mahasiswa Desain dan Arsitektur**, Djembatan, Jakarta, (1999)
- [11] Tarigan, Hemat. Korelasi Menggunakan Perpustakaan Dengan Indeks Prestasi Belajar Mahasiswa Fakultas Teknik USU Medan, **Jurnal Sistem Teknik Industri**, Vol. 7, No. 2, p. 61-72.
- [12] Uno, Hamzah B. **Teori Motivasi dan Pengukurannya: Analisis di Bidang Pendidikan**, Bumi Aksara, Jakarta, (2011)
- [13] Wiyono, Bambang Budi. Hubungan Lingkungan Belajar, Kebiasaan Belajar, dan Motivasi Belajar dengan Prestasi Belajar Siswa, **Forum penelitian**, th. 15, No. 1, p. 28-36.
- [14] Arslan, Kimberly. Multisensory Learning and the future of Teaching. Available from [http://EzineArticles.com/?expert=Kimberly\\_Arslan](http://EzineArticles.com/?expert=Kimberly_Arslan) Accessed: 2012 July 24.
- [15] Kompas.com. Perpustakaan Harus Dikelola secara Kreatif. Available from <http://edukasi.kompas.com/read/2011/11/18/20280412/Perpustakaan.Harus.dikelola.secara.Kreatif> Accessed: 2012 Februari 20.
- [16] Hartadi, setiawan. Kenapa minat baca masyarakat indonesia rendah?. Available from [http://library.perbanas.ac.id/index2.php?option=com\\_content&do\\_pdf=1&id=84](http://library.perbanas.ac.id/index2.php?option=com_content&do_pdf=1&id=84) Accessed: 2011 April 1.
- [17] Majid, Lita. Dampak Multimedia Terhadap Minat Baca Masyarakat. Available from <http://edukasi.kompasiana.com/2012/04/17/dampak-multimedia-terhadap-minat-baca-masyarakat/> Accessed: 2012 November 26.
- [18] Murtiningsih, Wahyu. 1997 : Menuju Perpustakaan Ideal. Library News Bulletin. Available from <http://kober.tripod.com> Accessed: 2011 April 1.



- [19] Mydas, Chelonia. Bentuk Skala Pengukuran Dalam Penelitian. Article Online: <http://www.rhynoblog.com/2011/03/bentuk-skala-pengukuran-dalam.html> Accessed: 2011 Mei 13.
- [20] Rahmadhani, Suhersi. Membangun Citra Perpustakaan Ideal. Available from [http://arpusda.jatengprov.go.id/index.php?option=com\\_content&view=article&id=811:membangun-citra-perpustakaanideal&catid=47:perpustakaan-asrip-perpustakaan&Itemid=119](http://arpusda.jatengprov.go.id/index.php?option=com_content&view=article&id=811:membangun-citra-perpustakaanideal&catid=47:perpustakaan-asrip-perpustakaan&Itemid=119) Accessed: 2012 Desember 1.

### **Acknowledgements**

The researcher wish to thank to Allah SWT for the greatest life, Mr. Prabu Wardhono and Mr Martinus for the guidance. The participants, without you, my research wouldn't be done. My family, thank you for the support, especially my parents, a lot love for you. My husband, who can understand me very much. Ajar, thank you for the picture.