

LUMINANT ENVIRONMENT IN RELATION TO ENERGY, COST AND CUSTOMER EFFICIENCY IN UPSCALE RESTAURANT SETTINGS

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Abstract. *Restaurant is a place to accommodate a person to fulfill his needs of hunger. But a restaurant accompanies other factors along with hunger like interior, service, acoustics, timings etc. to satisfy customers. The most prominent feature of interior is light which enhances the beauty of a place. The lighting requires to be designed properly, the more efficient luminant environment, the more customers are expected in an eating place. This study analyzes the two lighting designs in view of their energy efficiency and cost which are concluded on the price and increase in number of customers in restaurant settings. The Lahore View (R1), restaurant's specialty is rope lights in blue color along with spot lights. The second one i.e. Jasmine restaurant (R2) is specific with its chandeliers and spot lights. The use of spot lights enhances the functionality – reduced energy consumption and efficient. The items such as rope lights and chandeliers are installed for aesthetics to attract customers. The conclusion is that lighting in R1 is more energy efficient and cost effective than R2 but the customers increase in almost equal ratio in both restaurants in changed lighting. That means the properly installed lighting can increase the business and this experiment can also be effective on other retailers.*

Keywords: Corporate Social Performance, Hotel Industry, Green Motives, Green Practices, Green Products

Introduction

The interior decoration plays a pivotal role in hospitality services, helps in self-selling by attracting customers' attention and contributes in improving the turnover and goodwill of any concern. The effectiveness of restaurant environment and turnover in particular depend upon the efficiency of the interior decorations (Arun & Alalmi, 2020).

The trends of life are changing rapidly which is making the life fast and busy. This business moved people towards the need of food and drinks which are ready to eat. This need increased the category of upscale restaurants in Pakistan (Mohsin, 2005). The customers when become clients have demands more than food and its quality like the place to choose for sitting and eating, the interior of that place and its beauty.

The studies have stressed to analyze such areas in context to restaurant especially in upscale restaurants, their interior, acoustics, color, lighting, etc. The important of customer is the all above features but for restaurateurs, the main significance is low expenses and high earnings. There is a need to conduct research on such topics in Pakistani environment as the numbers of researches in this context are very limited. The upscale restaurants are being increased in number and restaurateurs are trying to provide their best/moderate prices (Shahzadi, Malik, Ahmad, & Shabbir, 2018).

A restaurant is an investment to earn but it depends on its food and service and off course environment and design so perfection is required to increase turnover of the customers (Philips, 1964). When a customer spends some money and time in a place (e.g. in a restaurant), in return, s/he expects welcomed, relaxed and comfortable environment (Kotler, 1974; Ayaz, 2015). In this context, the main objective of this study was to evaluate two lighting designs in relation to economical lighting and expensive lighting as well as their light efficiency level in relation to change in customers' turnover.

Literature Review

The places are designed for live creatures like for humans who struggle to make their living place and surroundings accordingly to get comfort and relaxation. The restaurant activity or eating outside is an increasing trend though coupled up with our busy routine and shortage of time (Ozturk, 2003).

In this scenario the restaurants are increasing in number whether cafes, upscale restaurants, grills, take away and motels but now after a number of researches, it is very obvious that people as customer not only demand food and service quality but prefer a place with their luminant environment and beautiful interior. The interior of a place especially like for restaurants requires to work on building materials, color, acoustics, ambiance and most interesting is a place with its appropriate lighting (Ciani, 2010; Ayaz, 2015).

There are numerous options for creating moods with lighting, some want cozy and quiet feeling, others want bright and glowing lights. The responsibility is of the interior and lighting designers to represent a theme in an interior. The more appropriate lighting means the more interest of the people to come and to spend time (Southern, 2005). The relationship of environmental

factors with customer's turnover is already acknowledged, for instance the interior designers, architects, entrepreneurs, and most interestingly environmental psychologists (Milliman, 1986; Veitch, 2001; Ayaz, 2015).

Proper planned lighting definitely increases in business because it is true to say that without light there is no life on earth. But it needs attention in our country to plan and design according to the requirements of the place and desire of the people (Ciani, 2010). Including other factors, lighting is also one of the significant factor for customers to decide whether they will to come to the same restaurant again or will go elsewhere. Either some customers do not bother lighting directly but the light is impacting on them indirectly. The both physical and psychological requirements of the customers are to be accommodated when lighting is initially being planned (Flynn, 1973; Southern, 2005; Ayaz, 2015).

The lighting is an influential factor which can decide the trends and tastes like choosing the color of light is also very important. Because it also effects the customers and can increase or decrease the time of their stay in the restaurants (Bilgili, Ozkul, & Koc, 2020). The lighting requires being economical, functional and aesthetical. Its economical in two ways; one at the time of installation and second during its usage i.e. in both senses as energy efficiency and cost effectiveness. The functionality depends on the required lumens and aesthetics is followed in the sense of style and resulted ambiance (Philips, 1964; Ayaz, 2015). Flynn (1973) also investigated about lighting in the real environment and suggested that lighting is necessary for the task to be performed and it enhances an interior which ultimately can increase the business (Flynn, 1973) by raising the number of customers (Jay, 2002).

The avoidance of over illumination or less illumination is also an important factor to be considered. While designing for lighting which gives us appropriate level of lighting, it also assists to plan economical lighting design which must be the first and foremost step to plan for lighting. Secondly budgeting is very important to decide, the style, size, power and usage all is important to choose from a number of options in the market (Philips, 1964). Such as accurate number of light levels according to IESNA Lighting Handbook, 8th edition, for the dining is 10 to 15foot candles (Veitch, 2001). If chosen spot lights they are for the best to focus on a person or place so they can be used to highlight a specific dish or table and to create an ambiance with clarity, motivation, concentration and warmer than the use of energy savers (Veitch, 2001).

A person can sense/feel dim lighting and spot lights environments as a personal place (Philips, 1964). The dim lighting all around the restaurant and

spot lights over the table tops also increase the stay of customers. The spot lights are economical in the way they are available in low price and their efficiency is more than ordinary lights as the light of compact fluorescent bulbs, energy savers which get unclear by the frequent and regular use (Schirmbeck, 1983; Southern, 2005; Ayaz, 2015).

The spot light is also having long life and not need to be changed frequently. On the other side fluorescent lights require to be changed after a short period of time maximum of six months. The light bulbs, energy efficient, lose on average 22% of their brightness over their lifetime according to an Engineering and Technology magazine (Robson, 1999). If decorative lighting is required to enhance the interior as well as ambiance then chandeliers are best, which are available in many sizes, materials and designs. These create attractiveness and focal points for the customers and are mostly recommended for formal, dramatic and relaxed ambiance (Ciani, 2010).

A good lighting design is considered by the central fixtures which provide comfort, safety and bright light. The chandeliers are also considered for warm, bright and rich lighting. The fashion of chandeliers is not getting out as their style and variety always attract persons whether at home or at business places.

Material and Methods

The study was experimental in which two different lighting designs were selected to compare with each other in context to their energy efficiency and economical value. One consisted energy efficient low-cost lights and other one was the less energy efficient high-cost lights. The two restaurants were selected; one was Lahore View (R1) and Jasmine Restaurant (R2). The previous lighting was changed in both the restaurants.

The lighting installed in R1 was rope lights and spot lights (figure 1) which were altered because the energy savers and lamps needed to be changed. The lighting installed in R2 was consisted on chandeliers and spot lights and here also previously installed energy savers and other lighting fixtures were removed. The chandeliers were huge and bright each having fifteen fixtures for light bulbs and total of eight chandeliers were fixed.



Figure 1 Lighting in R1 (Lahore View)

The light level was measured in both restaurants after altering the light fixtures and tried to maintain a level between 10 to 15 foot candles which is also recommended for dining.

The two factors which were considered in the study in relation to economical lighting were cost and energy efficiency. The lighting was also evaluated by comparing the customers' number both in previous lighting and new lighting. The customer's number was taken from administration on monthly basis.



Figure 2 Lighting in R2 (Jasmine Restaurant)

Results and Discussion

Table 1 shows that in R1 the previous energy savers, lamps, wires and electrician cost totaled Rs. 23040. After changing the lighting, the cost of 30 sq. ft. installed rope lights is Rs. 8,400, 18 spot lights of Rs. 5,040 and if added other expenses of electrician and wires the total cost is Rs.

25,440. The cost of new lighting in R1 is higher than previously installed energy savers and lamp.

Table 1 *Expenditure of Lighting Design in R1 (Lahore View)*

R1		Old Lighting			New Lighting		
Item	Qty.	Price/ Piece	Total (Rs)	Item	Qty.	Price/ Piece	Total (Rs)
Energy Savers	24	210	5040	Spotlights	18	280	5040
Lamps	6	2500	12000	Rope Lights (Sq. Ft.)	30	280	8400
Electrician & Others			6000	Electrician & Others			12000
Total Rs.		23040		Total Rs.		25440	

Table 2 shows that in R2 (Jasmine) the previous energy savers, lamps, wires and electrician cost total Rs.14700. After changing the lighting, the cost of 8 installed chandeliers is Rs. 44000, 15 spot lights of Rs. 4200 and if added other expenses of electrician and wires the total cost is Rs. 64200. The cost of new lighting in R2 is also higher than previously installed energy savers and lamps. According to the results, given in table 1 and 2, both of the restaurants were costed higher for altered lighting than previous lighting.

Table 2 *Expenditure of Lighting Design in R2 (Jasmine Restaurant)*

R2		Old lighting		New lighting			
Item	Qty.	Price/Piece	Price (Rs.)	Item	Qty	Price/Piece	Price (Rs.)
Energy Savers	20	210	4200	Spot Lights	15	280	4200
Lamps	5	2500	5000	Chandeliers	8	5500	44000
Electrician & Others			5500	Electrician & Others			16000
Total Rs.		14700		Total Rs.		64200	

A big variation was visible in expenses on altered lighting in both restaurants; the final expenditure in R1 – Rs. 25440 and in R2 – Rs. 64200. The reason to select the LED rope light in R1 was the capability to highlight the place because of being more durable, energy efficient than standard incandescent rope lights. The reality is that Spot lights consume less energy, maximum of seven times and their life time is three times more than any other light fixtures.

The expense in R2 was higher than R1, the use of chandeliers costed high in R2. The total of eight chandeliers were used and one chandelier costed Rs.5500. These stylized chandeliers were costed high (Types of lighting) than the usual ones. But the main idea was to satisfy customers in new lighting design which can also contribute in profit of the restaurant, so the expenses could be easily adjusted with outcome.

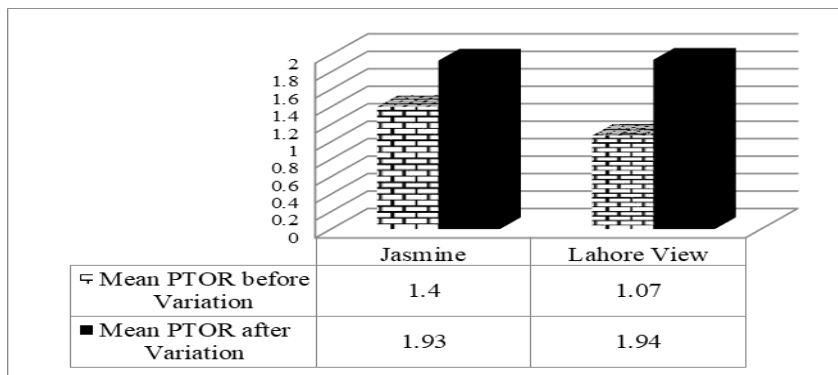


Figure 3 PTOR in R1 & R2

The energy savers were being used previously in both restaurants and reported that they had to be changed frequently when their light got dim, which was a hassle and increased the cost of lighting. The third part of the study was to compare the customers' number both in previous lighting and new lighting in two selected restaurants.

The Patron Turnover Rate (PTOR) was increased in both restaurants (considering the second phase of the study) as mentioned in graph figure 3. The ratio of increase is from 1.07 to 1.94 with net increase 0.87 in R1 in PTOR and increased from 1.4 to 1.93 with net increase 0.53 in R2 in PTOR. It is concluded that the lighting in both restaurants attracted the customers.

Conclusion

The results concluded that the lighting can be designed keeping in view the economical, aesthetical and functional aspects. The lighting impacts the business positively by attracting the customers in case the properly planned lighting is installed High cost doesn't guarantee to have more business but it is the design and lights which if selected properly can augment the turnover. Thus the selection must be according to the standards and requirements. The same

can be observed in figure 3 that PTOR has increased in the new lighting in both the restaurants.

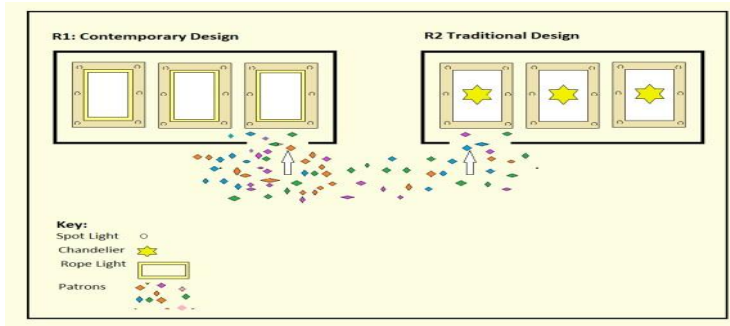


Figure 4 Ceiling Plan of R1 & R2

Summing up, it is concluded that the economical luminant design increases the PTOR, the more economical and energy efficient is R1 compared to R2.

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