ASSESSING THE EFFECT OF KITCHEN LAYOUT ON EMPLOYEE'S PRODUCTIVITY

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ABSTRACT

A cross sectional survey was conducted to assess the impact of kitchen layout on employees' productivity. A purposive sampling technique was used to select 90 respondents from three (3) company kitchens in the Takoradi Metropolis of Ghana. The samples included all kitchen staff irrespective of their gender, age and position. Data was collected from these respondents using a structured questionnaire and collected data was analyzed using the SPSS software. It was found out that most of the respondents did not have much knowledge about the concept of kitchen layout designs. Though a few of the respondents reported that their kitchen layout makes work difficult, most indicated that the layout of the kitchen they work in makes their work very easy. Majority of them also indicated that their kitchen arrangements gave them enough space to operate which allowed them to have easy movement from one station to another thereby improved their working speed. Finally, only half of the respondents said they knew that working in a poor layout designed kitchens could have some effects such as stress, respiratory problems, bodily pains and headaches on their health. The study recommends that kitchen staff be educated on the concept of their kitchen layout and the associated benefits to boost productivity.

Key words: Kitchen Layout, Productivity, Kitchen Staff, Company Kitchens

INTRODUCTION

The kitchen is a room or an area equipped for preparing or cooking healthy nourishing substance that is eaten, drunk and otherwise taken into the body to sustain life, provide energy, promote growth and repair worn-out tissues. The kitchen, or food production facility, is the heart of food service system Freeman (2004). The kitchen usually is a very large and complex facility. The layout and design of the kitchen is based on efficiency of product flow through the food service system (Rodgers, 2007). The flow of food should move in one direction, do as little crossing paths as possible, and move the shortest distances possible.

Pehkonen et al. (2009), further stated that the layout and design of the kitchen needs to take into account employee productivity. Space needs to be adequate to complete the work required, but not so large that employees spend lots of time walking from place to place. Efficiency in labor use will drive layout decisions. The durability of the kitchen is an important consideration in planning the layout and design of the facility. The main function of a kitchen is cooking or preparing food. The introduction of modern technology into the kitchen arrangement to reduce clumsiness and accidents is commonly referred to as Kitchen Layout (Pehkonen et al., 2009).

According to (Fujii, Kaihara, Uemura, Nonaka, & Shimmura, 2013; Pehkonen et al., 2009), there are many types of kitchen layout designs on the market for a modern-day kitchen. These designs are broadly arranged in two ways, namely: The Open-planned kitchen and Closed or partitioned kitchen .In 1993, the "Building Research Council", of the School of Architecture (University of Illinois) at Urbana-Champaign formalized the notion of the kitchen work triangle: a natural triangular arrangement of the most visited points in the kitchen based on the three main functions there (that is, food storage, preparation and cooking) with the refrigerator, the sink and the stove at a vertex each (Llewellyn, 2004). The most common forms of the kitchen as stated in the works of (Freeman, 2004) are the One-wall (Single-file), Galley, L-shaped, G-shaped and U-shaped. The layout of a kitchen may be described as the best practical arrangement of furniture, equipment and persons within the available floor space in order to achieve the maximum output of work (Llewellyn, 2004).

Some kitchen layout designs such as the G-shaped as well as the L-shaped design tends to lend itself to accommodating more than a single cook or kitchen staff within the working area. This

promotes a frequent healthy level of interactions (informal and unplanned) between a supervisor and a subordinate as well as colleagues working together regarding the flow of instructions and directions which in turn enhances an employee's job satisfaction, organizational commitment and productivity (Pratten, 2003; Spanu, 2013).

According to Gutnick (2007) in addition to a healthy level of communication and personal motivation in the workplace, the actual physical layout of the kitchen is extremely important when it comes to maximizing productivity. While many managers and business owners choose to suffice with a certain minimum level of kitchen furniture and accessories, they may be ignoring what can amount to a major obstacle on the path to increasing employee productivity. To ensure that quality employees are given a workspace that they can call their own, there should be high levels of importance placed on helping workers foster a sense of "place" in your company (Pehkonen et al., 2009).

Rodgers (2007), reported in an article that a productive work environment requires management that is able to positively motivate its employees in an infrastructure that is good to employees' needs. Employee's surroundings play a big part in his or her productivity level in the workplace and the kind of kitchen furniture employees use also play a big role (Fujii et al., 2013).

Open-plan offices, in which people work in large, open spaces with few physical barriers, were introduced into the kitchen with the idea of increasing collaboration, creativity, and productivity as they were meant to encourage a sense of group togetherness and make employees feel like part of a more relaxed, creative enterprise. However, "psychologically, the repercussions of open offices are relatively straightforward. Physical barriers have been closely linked to psychological privacy, and a sense of privacy boosts job performance" (Radzikowski, 2015). So while the open layout is beneficial for working together, it diminishes the quality of individual work. In some ways, it improves collaboration and communication in the workplace but at the same time does little to enhance creativity and, in many instances, has negatively impacted productivity. In one study, people reported not having enough privacy and being distracted by too much noise (Rodgers, 2007). Against this background, the arrangement of the kitchen should make it easy for employees to carry out their duties, the flow of work to be less complex and noise should be reduced to the barest minimum.

In their work on "Exploring open kitchen's impact on cleanliness's perception" Chow, Alonso, Douglas, and O'Neill (2010) reported that as food preparation workers are so paramount to food safety, a probe into factors that influence their behavior is warranted. Hertzman and Barrash (2007), assert that a poor kitchen layout affects performance of employees. Though no one sets out to create a poor kitchen layout, it often happens over time, that is, new equipment and supplies are added to the kitchen as well as new employees hired. This may lead to employees to overstretch, sit, stand too long or use awkward postures in cooking. This makes working in the kitchen difficult, takes too much time in preparing foods and does not create safe atmosphere or environment for better delivery of performance. For this reason, the researchers sought to assess the level of knowledge of employees' about kitchen layout design and its effect on employees' productivity.

Study Design, Area and Sample

The study adopted a mixture of an exploratory and qualitative survey design using three company kitchens in the Takoradi metropolis of Ghana. For purpose of anonymity the companies selected were coded as A, B & C respectively. Matrons, supervisors and subordinates from these company kitchens were the respondents for the study. These were selected because they have in debt knowledge and firsthand information on the topic under study. Purposive sampling technique was used to select 90 respondents from the selected company kitchens.

Data Processing and Analysis

The primary data resulting from the survey were analysed using both descriptive and inferential statistics. The appropriate statistical tools were applied to the data based on the objectives of the study. The statistical tools that were specifically applied in analysing the data were frequencies, percentages and averages using the SPSS software. It consists of distribution of respondents among the selected companies, respondents' knowledge of the concept of kitchen layout, the impact of kitchen layout on productivity among others.

Table 1: Distribution of Respondents among the Selected Companies

	Respondents			
Companies	Matrons	Supervisors	Subordinates	Total
Company A	1	2	25	28

Company B	2	4	25	31
Company C	2	4	25	31
Total	5	10	75	90

Source: ***Field Work, June 2016***

Table 2: Years of Experience in the Industry

Years	Frequency	Percent
Below 1	21	23.3
1 – 5	45	50.0
6 – 10	6	6.7
11 – 15	6	6.7
Over 15	12	13.3
Total	90	100.0

Source: ***Field Work, June 2016***

From table 2, it can be seen that, exactly half of the respondents, that is, 50% had from 1- 5 years of experience. Those with the least years of experience had below a year experience and they comprised 23.3% of the total. On the other hand, the highest years of experience were over 15 years and they made up 13.3% of the respondents.

Table 3: Respondents' Knowledge of the Concept of Kitchen Layout

	Do you know of the concept of kitchen layout?	
	Yes	
Description	Frequency	Percent
Arrangement of kitchen for easy movement	15	62.5
Design of kitchen	9	37.5
Total	24	100.0

Source: ***Field Work, June 2016***

Table 3 presents knowledge of respondents on kitchen layout. Out of the 24 respondents who said they knew the concept of kitchen layout, 15 (representing 62.5%) stated kitchen layout to be the arrangement of kitchen for easy movement. The others (37.5%) simply put it as the design of

the kitchen. This suggests that most of the kitchen staff members who indicated that they knew of the concept of kitchen layout could describe what it was. Their definitions were a little close to that which was stated as modern technology in kitchen arrangement to reduce clumsiness and accidents (Pehkonen et al., 2009), a manner in which the typical components are the stove, the sink, the refrigerator and the cabinets.

Impact of Kitchen Layout on Productivity

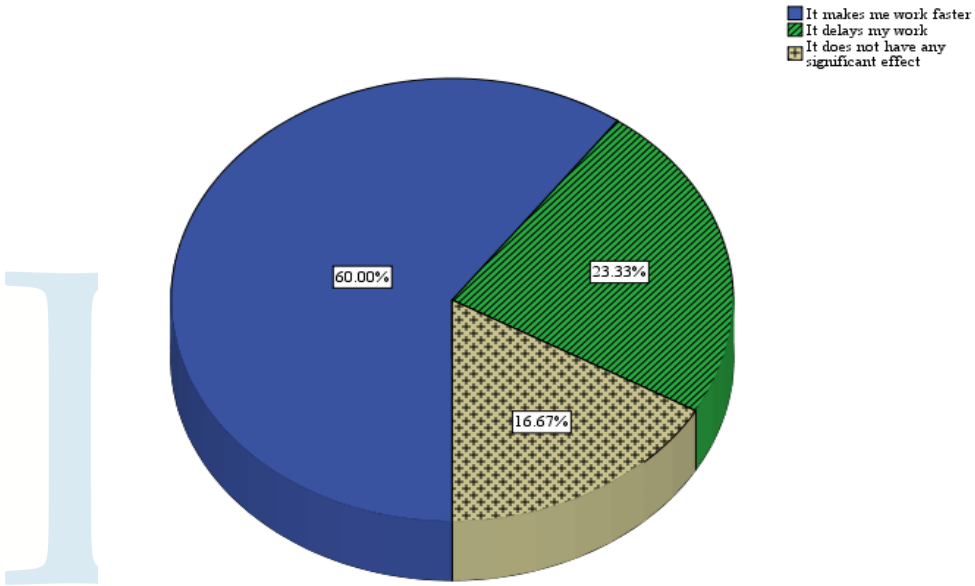

Figure 1: The Impact of Kitchen Equipment on Respondents Work

Source: ***Field Work, June 2016***

As can be seen from Figure 1, about 60% of the respondents pointed out that the arrangement of equipment used in the kitchen helped them work faster. That is the equipment helped them to accomplish their tasks quickly as Rodgers, (2007) intimated that manufacturers are constantly using technology to alter products to become more resourceful, reducing time, energy and required labor to produce a menu, without any compromise to kitchen efficiency or productivity. However not all the respondents shared this positive thought, 23.33% indicated that the arrangement of the equipment they used delayed work process. That is, the equipment slowed down the pace they desired to work. 17% of the respondents were of the view that the equipment

did not have any significant or noticeable impact on their works. This is because equipment that is too complex, has higher capacity, or is higher-powered than needed can impede productivity because staff do not want to or cannot use the equipment efficiently.

Table 4: Impact of Spacing of the Working Area on Respondents' Work

	Arrangement of kitchen given staffs enough space to work					
	Yes		No		Total	
Impact of spacing	Frequency	Percent	Frequency	Percent	Frequency	Percent
It enables easy movement from one station to the other	48	55.2	3	3.4	51	58.6
It restricts movement from one station to the other	0	0.0	9	10.3	9	10.3
It causes delay in work	3	3.4	9	10.3	12	13.8
It improves working speed	12	13.8	3	3.4	15	17.2
Total	63	72.4	24	27.6	87	100.0

Source: ***Field Work, June 2016***

As can be seen from Table 4, most (about 72%) of the respondents indicated that the arrangement of the kitchen gave them enough space whilst about 28% of them said the arrangement gave them little space to operate in the kitchen. About 69% of them pointed out that the arrangement allowed them to have easy movement from one station to another (about 55%) and improves their working speed (about 14%). The kitchen should be arranged in such a way that work at one place does not interfere with work at another place and the distance between these places should not be unnecessarily large but have no obstructions in the kitchen (Ghiselli, Almanza, & Ozaki, 1998). On the other hand, about 21% of the respondents indicated that the arrangement of the kitchen does not favour them because their movement from one station to the other is restricted (10.3%) and their work is also delayed (10.3%).

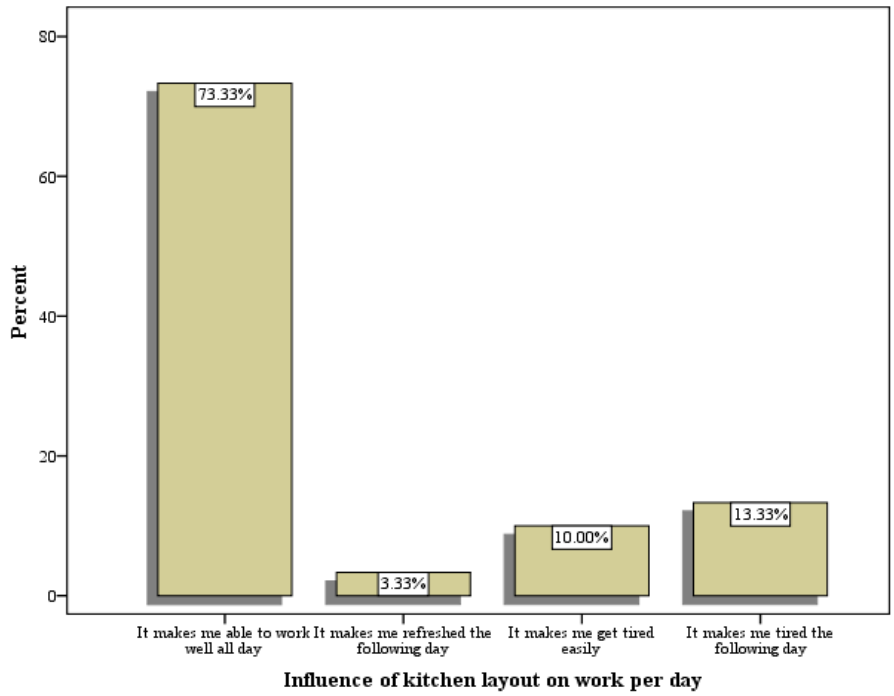

Figure 2: Influence of the Kitchen Layout on Respondents' Work

Source: ***Field Work, June 2016***

It can be observed from Figure 2 that most (about 73%) of the kitchen staff members indicated that the layout of the kitchen arrangements made them work well all day whilst a few (about 3%) of them indicated that the arrangement of their kitchens allowed them to be refreshed for the next day's work. On the contrary, about 23% of them said that the kitchen arrangement affects them negatively by making them get tired easily (about 10%) as getting them tired for the next day's work (about 13%). This suggests that the layout of the companies' kitchens affect the respondents' works positively by making them able to work throughout the day as (Norman, 2002) stated that aesthetic designs or attractive things make work better.

Conclusions and Recommendations

Findings of the study conclude that kitchen layout and its arrangement as well as the equipment used in the kitchen gives the kitchen staff members enough space to operate. This allows them to have easy movement from one station to another and improves their working speed to accomplish their tasks quickly.

Also, the layout of the kitchen that respondents work in promotes productivity by making their work very easy, thereby making them work well all day and refreshed for the next day's work. Finally, an efficient kitchen layout eliminates problems such as stress, respiratory problems, bodily pains and headaches which in turn increases their speed of work and heightens their desire for work.

The study recommends that:

1. Kitchen staff be educated on the concept of their kitchen layout and the associated benefits to boost productivity.
2. Kitchen staff should be given on-the-job training to equip them on how to work with the modern trends of kitchen layout designs and equipment especially when new equipment are installed.
3. all stakeholders involved in the setting up of kitchens should factor the nature of work carried out at the various kitchens and design it to promote productivity.

REFERENCES

Chow, A. J., Alonso, A. D., Douglas, A. C., & O'Neill, M. A. (2010). Exploring open kitchens' impact on restaurateurs' cleanliness perceptions. *Journal of Retail & Leisure Property, 9*(2), 93-104.

Freeman, J. (2004). *The making of the modern kitchen: A cultural history*: Berg Publishers.

Fujii, N., Kaihara, T., Uemura, M., Nonaka, T., & Shimmura, T. (2013). *Facility layout planning of central kitchen in food service industry: Application to the real-scale problem.* Paper presented at the IFIP International Conference on Advances in Production Management Systems.

Ghiselli, R., Almanza, B., & Ozaki, S. (1998). Foodservice design: Trends, space allocation, and factors that influence kitchen size. *Foodservice Research International, 10*(2), 89-105.

Gutnick, L. (2007). A workplace design that reduces employee stress and increases employee productivity using environmentally responsible materials. *Masters Theses and Doctoral Dissertations*, 151.

Hertzman, J., & Barrash, D. (2007). An assessment of food safety knowledge and practices of catering employees. *British Food Journal, 109*(7), 562-576.

Llewellyn, M. (2004). Designed by women and designing women: gender, planning and the geographies of the kitchen in Britain 1917-1946. *Cultural geographies, 11*(1), 42-60.
Norman, D. (2002). Emotion & design: attractive things work better. *interactions, 9*(4), 36-42.
Pehkonen, I., Takala, E.-P., Ketola, R., Viikari-Juntura, E., Leino-Arjas, P., Hopsu, L., . . . Nykyri, E. (2009). Evaluation of a participatory ergonomic intervention process in kitchen work. *Applied ergonomics, 40*(1), 115-123.
Pratten, J. D. (2003). The training and retention of chefs. *International Journal of Contemporary Hospitality Management, 15*(4), 237-242.
Radzikowski, P. S. (2015). Reduced Cognitive Performance: Open-Plan Offices, Noise and Collaboration.
Rodgers, S. (2007). Innovation in food service technology and its strategic role. *International Journal of Hospitality Management, 26*(4).
Spanu, J. T. (2013). *Restaurant Design: An Industrial Engineering Perspective.* California Polytechnic State University, San Luis Obispo.