Influence of Knowledge Technology Transfer on the Growth of Micro and Small Catering Enterprises in Nairobi County, Kenya

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Abstract- Technology transfer usually involves some source of technology group which possess specialized technical skills which transfers the technology to a target group of receptors who do not possess those specialized technical skills and who, therefore, cannot create the tool themselves. Micro and Small Enterprises (MSEs) need to be strengthened and developed so that the income they generate can support transition in terms of enterprise growth. Over the years, Catering MSEs have shifted from the old traditional methods of operation through the transfer of technology. Therefore this research was carried out so as to avail information on the influence of technology transfer to the growth of Catering MSE's. The research gathered information on the influence of technology transfer of production skills, knowledge on the growth of MSEs in terms of output, sales volume, profit and assets within the catering sector in the hospitality industry in Nairobi County. The study was conducted using survey method of data collection with both qualitative and quantitative approach. There was a total population of 11,162 licensed Catering MSEs in Nairobi County. A total of 384 respondents were picked through random sampling. Data was collected using a questionnaire with both closed and open ended questions. Interview guide was used in carrying out interviews. The data obtained in the study was analyzed using descriptive statistics such as means, frequencies and standard deviation. Inferential statistics used in the study included correlation and multiple regressions in order to determine the relation between the independent and dependent variables. Correlation technique was used in the study to analyze the degree of relationship between the independent and dependent variables while logit regression analysis was used to determine the effect of technology transfer on knowledge. Data was also subjected to factor analysis. The Binomial Logistic Regression was also used to analyze the data. Statistical package for social sciences (SPSS) Version 22 was used to run the data. Data were presented by use of frequency distribution tables, bar graphs and pie charts. The study established that transfer of production skills, equipment, knowledge and processes leads to the growth of micro and small catering enterprises in Nairobi County. Growth was measured in form of profit margin, increase in employees, increase in customers, enlargement in firm size and enhancement in quality of products and services. The study concluded that technology transfer of knowledge had an influence on the growth of micro and small catering enterprises. The study recommendations were: inclusion of more females in micro and small catering enterprises where the government offers incentives to female entrepreneurs through waiver of business license fees, government should initiate special capitation through budgetary allocations to cushion micro and small catering enterprises from collapse due to financial constraints and all firms should be encouraged to adopt the new and latest technology transfer in their businesses.

I. INTRODUCTION

1.1 Background to the study

In Kenya, the small business sector has both the potential and the historic task of bringing millions of people from the survivalist level including the informal economy to the mainstream economy. Recognizing the critical role small businesses play in the Kenya economy, the Government through Kenya Vision 2030 envisages the strengthening of MSE's to become the key industries of tomorrow by improving their productivity and innovation (GOK, 2007).

The vast majority of developed and developing countries rely on dynamism, resourcefulness and risk taking of micro and small enterprises to trigger and sustain the process of economic growth (Ramanathan et al., 2004). Micro and small enterprises (MSEs) that have invested in new technology have experienced marked growth in terms of customers and profits. Technology transfer has been used to refer to movements of technology from the laboratory to industry, developed to developing countries, or from one application to another domain (Philips, 2002). The transfer is both visible and invisible depending on the mode. The movement may involve physical assets, know-how, and technical knowledge (Bozeman et al., 2000).

1.1.2 Micro and Small Enterprises

Ever since the subject of MSEs was first introduced by International Labor Organization (ILO) mission to Kenya, micro and small Enterprise development has emerged as an important factor in economic growth particularly its potential in reducing the current unemployment crisis (Republic of Kenya, 1994). Findings from the 1999 MSEs Baseline Survey (CBS, et al.,

1999) showed that there were a total of 1.3 million enterprises employing some 2.4 million people and contributed over 75 % of all new jobs created in the country. The sector has continued to play an important role in Kenya's economy with a contribution to the Gross Domestic Product (GDP) increasing from 13.8% in 1993 to about 20% in 2007. In addition, the MSEs contributed over 57% of the new jobs created in 2005/2006 (2007) and 79.8% of total employment in 2008(Republic of Kenya, 2009).The impact of MSEs is felt in the greater utilization of local raw materials, employment generation, encouragement of rural development, development of entrepreneurship, mobilization of local savings, linkages with bigger industries, provision of regional balance by spreading investments more evenly, provision of avenue for self-employment and provision of opportunity for training managers and semi-skilled workers (GOK,1989).

1.1.3 Micro and small enterprise growth

Over the years the majority MSEs have grown gradually due to technology transfer of production skills, equipment, knowledge and processes. Evenson and Westphal (1995) define enterprise growth as a development process of enterprise from small to big and from weak to strong. Enterprise growth is the development process where enterprises keep the tendencies of balanced and stable growth of total performance level (including output, sales volume, profit and asset gross) or keeps realizing the large enhancement of total performance and the stage spanning of development quality and level.

The increase of quantity is embodied in the extension of enterprise scale such as the increases of sales volume, market share, production value, profit and employee. The growth of quality is embodied in the enhancement of enterprise quality, which includes the technological innovation ability from immature to mature production technology, the optimal efficiency of investment and output, the organizational innovation and reform (Massey et al., 2006).

1.1.4 Micro and Small Catering enterprise growth

The MSEs in the Catering sector are found within the hospitality industry and provide food, drink and accommodation to the customers. This is an industry that has its own products and markets, technology and production methods where the entrepreneur combines production and sales under one roof. Different ethnic groups in Kenya have their traditional dishes. Fish and "ugali"(Staple food for the Dholuo tribe in Kenya made with maize flour cooked in hot water and eaten with fish and green vegetables) are associated with the Dholuo tribe, "pilau" and "biryani"(Stable foods for the Swahili people found at the coast in Kenya made with rice as the basic ingredient). The difference in the two dishes is the herbs and the spices added, "irio" (Staple food for the Kikuyu ethnic group in Kenya made with maize and beans and mashed with potatoes and green vegetables).and githeri (Stable food for the Kikuyu tribe in Kenya made with maize and beans boiled in hot water), chicken and "ugali" with the Luhyas while "muthokoi" (Staple food for the Akamba tribe in Kenya made with traditionally broken maize) is associated with the Akamba tribe.

It is evident that MSE entrepreneurs have moved from the traditional methods of production and service to modern and better methods of production through technology transfer. Technology transfer has had a positive effect on the growth of MSEs within the catering sector. However; little information on the effect of technology transfer is available to these entrepreneurs. This study was carried out on MSEs in Nairobi so as to avail the much needed information to the entrepreneurs and the policy makers on the effect of technology transfer of knowledge on growth. For an enterprise to grow the human resource need to be improved in terms of training for better and more advanced and appropriate skills. MSEs have moved from the old traditional methods of production and have transferred technology to the enterprises and it is important that a scientific research be carried out to find out the effect of this and avail the much needed information.

1.1.5 Micro and Small Enterprise growth in Kenya

The significance of Kenya's MSEs activity has continued to grow since the sector was first brought in to the limelight in 1972.In a report by the International labor organization (ILO) on Employment Income and Equity in Kenya, the report underscored the sector's critical role in promoting growth in incomes and employment (ILO, 1972).

1.1.6 Technology transfer

Cohen (2004) describes in his book "the transfer process of technology to developing countries" that technology can be categorized into four forms as follows: technology as general theoretical and practical understanding of how to do things (know-how or information); technology as objects (goods or tools); technology as installed techniques of productions (processes).Cohen (2004) defines technology as the systematic knowledge of technique. This technique, as the interactions of person/tool/machine/object, defines a way of doing a particular task. Cohen (2004) defines technology as a combination of people, materials, cognitive and physical processes, plant, equipment and tools.

1.1.7 Technology transfer and Micro and Small Enterprise growth.

In a report presented by KIRDI (2006), for Kenya to industrialize and become competitive, it requires affordable, efficient and clean technologies and efforts to provide technologies to promote MSEs and increase their productivity, promote manufacturing, value addition and promote export oriented industries. According to the Journal of Small Business Management (2013), enterprise growth includes two aspects at least. The first aspect is the survival ability of enterprise. In the intensive market competition, the base of sustainable growth for enterprise is the survival ability of enterprise, and the generation of survival ability depends on the new technology, new product and new originality possessed by the enterprise when it is founded, which can make the enterprise to possess future wider space for competition advantage.

The second aspect is the sustainable development ability of an enterprise. After the generation period, the enterprise survives in the market in virtue of its special survival ability, and whether the enterprise faces favorable circumstance or adversity, it can possess the sustainable development ability to exceed itself and keep developing (Journal of Small Business Management, 2013).

1.2 General objective

The general objective of this study was to find out the influence of technology transfer on the growth of micro and small catering enterprises in Nairobi County, Kenya

1.2.1 Specific objective

i. To examine how knowledge embodied technology transfer has influenced the growth of Catering Micro and small catering enterprises in Nairobi County-Kenya.

II. LITERATURE

2.1 Knowledge

According to Gibson (1994), the most effective way to accomplish technology transfer is to transfer the people with the requisite knowledge to the arenas where that technology is needed. As we move more rapidly into the full utilization of computers and related technologies this is more evident than ever before, but there is a broader aspect of technology transfer which is easily overlooked. That is the transfer of the fundamental scientific and technological knowledge and skills to the larger numbers of people required in the work place to ensure that the technology is successfully "transferred" and efficiently used. Capacity transfer includes provision of the know-how and software not simply to manufacture existing products but, more importantly, to innovate and adapt existing technologies and products, and ultimately design new products (Phillips et al., 2002).

Low educational achievement leads to a general failure of most MSEs. Proprietors must appreciate the role of technology in production processes, product quality and market competitiveness. Even where they develop interest in new technology, their limited education adversely affects the absorption capacity of acquired technology (ILO, 2005). International movement of people is associated with nationals studying or working abroad for a limited period and applying their new knowledge when they return.

Cohen and Levinthal (2004) argue that the capacity to make use of external knowledge is a function of the level of prior related knowledge. This prior knowledge includes basic skills, shared language and also knowledge about the last Scientific and technological developments. Buzz refers to the information and communication ecology created by face-to-face contacts, co-presence and co-location of people and firms within the same industry and place or region. This buzz consists of specific information and continuous updates of this information, intended and unanticipated learning processes in organized and accidental meetings, the application of the same interpretative schemes and mutual understanding of new knowledge and technologies, as well as shared cultural traditions and habits within a particular technology field, which stimulate the establishment of conventions and other institutional arrangements. Persons in a buzz environment work together and interact with other skilled individuals,

Catering enterprises today have to compete for survival, growth and profitability Managers within the industry have to learn to adjust to change in line with the market demands for quality and value for money (British Hospitality Association, 2009).In Kenya, universities, technical colleges and youth polytechnics have introduced hospitality and tourism units with Catering courses as a core unit so as to train the personnel for the MSEs in Catering.

Table 2:1 A typology of training activities for technology transfer (Lasserre, 1982)

Objective of training	Appropriate method
To be able to follow and apply a well specified set of instructions. (Machine operator learning a particular sequence of operations)	**Applicative** Learn and apply the rules and procedures. This can be done by demonstrations and programmed instructions.
To be able to interpret general principles in order to apply them to particular operations. (Foreman has to control workshop)	**Duplicative** Type of training most frequent in academic and vocational institutes. Trainee has to learn the basic principle and to observe their applicability through exercises.
To be able to understand and replicate the specific hidden characteristics and ill-defined tasks of a job. (Cook wants to learn from the chef)	**Imitative** Coaching method by pairing individual, spend time with the trainee to find hidden characteristics of the job.
To be able to develop new methods of work or new products.	**Innovative** Teaming methods, both the transferor and the transferee work together to innovate.

Source: Lasserre, (1982)

III. RESEARCH DESIGN

According to Kothari (2003) the research design constitutes the blueprint for the collection, measurement and analysis of data. In other words, it is a master plan specifying the methods and procedures for collecting and analyzing the needed information. It ensures that the study would be relevant to the problem and that it uses economical procedures in collection and analysis of data. The descriptive research design was used for this study among the catering MSEs in Catering in Nairobi County, Kenya to establish the influence of technology transfer on their growth. The researcher carried out survey method of data collection from a sampled population. The researcher gathered information and the respondent's opinions, experiences and feelings on the influence of technology transfer on the enterprises where they work. More often than not the data was in qualitative form which was coded into categories for analysis. In this study, a combination of qualitative and quantitative approaches of doing research was used as recommended by Creswell (2009). It was therefore a mixed research design.

The subject of analysis was micro and small catering enterprises in Nairobi County, Kenya. The study was designed to collect both quantitative and qualitative data from entrepreneurs who own, finance and manage micro and small catering enterprises. This enabled the researcher establish whether the four postulated determinants (production skills, equipment, knowledge and process) technology transfer had influenced their growth.

A Quantitative research approach is a systematic investigation of scientific mathematical properties and their relationships. (Cooper & Schindler, 2011). This research approach involved the testing of the hypothesis that technology transfer influences the growth of MSEs within the catering sector. The measurements were quantitative and later analyzed using statistical techniques. According to Mugenda and Mugenda (2003) quantitative approach focuses on designs, techniques and

measures and produce numerical discreet data or quantifiable data. The research employed a mixed model approach whereby it combined both qualitative and quantitative data collection approaches. It was necessary to use this approach as it increased the statistical reliability of the results (Kothari, 2004).This model approach also made it possible for the researcher to infer to the micro and small catering enterprises.

A Qualitative approach refers to the in-depth investigation and is more descriptive than numerical was also used in this study (Saunders et al., 2007). Qualitative approach on the other hand involved the interpretation of phenomena without depending on numerical measurements or statistical methods. It was mainly concerned with observing, listening and interpretation of phenomena. The use of both qualitative and quantitative data approaches reinforces each other (Kombo et al., 2006).Interviews were conducted on one-to-one basis which allowed for interaction with the respondents during data collection and made it possible for clarification of any unclear issues. The qualitative data collected using questionnaires, interviews so that the analysis and reporting was narrative. In this study, qualitative data was quantified by converting it into numerical codes and then analyzed statistically. Therefore the descriptive study describes the phenomena as it is Saunders et al., (2007).This design was the most suitable for this study because the determinants were studied in the field without manipulation.

3.1 Target Population

The population for this investigation was small scale entrepreneurs in the catering sector within the hospitality industry Nairobi County. The Nairobi Central Business District is defined by the Nairobi Central Business District Association (NCBDA) which is a registered society under the Societies Act (Cap 108) and was formed in May 1997 as a rectangular shape, around the Uhuru Highway, Haile Selassie Avenue, Moi Avenue and University Way. According to the Daily Nation of 25th March, 2013, Kenya has shown tremendous economic growth over the past ten years which has increased in industries in Nairobi Central Business District. As a result the labor force population has gone up. Catering MSEs which provide food and drinks to the labor force have also increased in number over the past ten years.

The study target population included Medium Restaurant with bar/Membership club, Small Restaurant with bar/Membership club. These two categories are basically the same as both of them serve all types of meals which include lunches and dinners to their customers. The only variation is the size and therefore the number of customers served which also determine the number of employees.

In Mega eating houses, Snack Bar, Tea House "Hotel", Medium eating House, Snack Bar Tea House "Hotel", Small eating House, Snack bar, Tea House -These three categories are basically the same as they offer a limited choice of popular foods and snacks at a reasonable price with little or no waiting time. The foods or snacks can be consumed on the premises or purchased over the counter and taken away to be eaten elsewhere. Tea and coffee are available for customers as accompaniments. The only variation is the size and therefore the number of customers served which also determines the number of employees.

The sixth category is "Other Catering and Accommodation" in Nairobi Central Business District. This category includes catering concerns that undertake freelance catering as a business. Outside catering for functions, Schools and hospitals and any other enterprise are in this category. All the items in the field of enquiry constitute the "universe" or population (Kothari, 2004).

3.2 Sampling Frame

There was a total of eleven thousand, one hundred and sixty two (11,162) licensed micro and small catering enterprises in Nairobi in 2014/2015. According to Mugenda & Mugenda (2008), Stratified random sampling helps the researcher achieve the desired representation of various sub –groups in the population. The total population embraced six categories of different sizes therefore the frame was organized by the six categories into separate strata. The researcher chose this method so as to have existing sub-groups fairly and randomly represented within the sample. The method also ensured that every group in each category was proportionally represented

Table 3.1: Total licensed micro and small catering enterprises in Nairobi.

Code	Strata	Total
543	Medium Restaurant with bar/Membership club	1,234
546	Small Restaurant with bar/Membership club	1,327
549	Mega eating house, Snack Bar, Tea House "Hotel"	667
552	Medium eating House, Snack Bar Tea House "Hotel"	1,445
555	Small eating House, Snack bar, Tea House	5,673
595	Other Catering and Accommodation	776
Total		11,162

Source: Nairobi County (August, 2014).

3.3 Sampling technique

Enterprise owners from the stratum samples provided the information for the study. Stratified simple Random sampling method was used in the selection of the samples. Since all probability samples must provide a known nonzero probability of selection for each population element, the stratified simple random sampling is considered a special case in which each population element has a proportional and equal chance of

selection; it ensures that every population representative has an equal chance of being represented (Mugenda & Mugenda, 2003).

The researcher used simple random sampling which had no complexities involved. All you need is a relatively small, clearly defined population. According to Kombo and Tramp (2006) a researcher may simply obtain a list of the whole population and then use a sequence of numbers from random numbers table (or draws of a hat, flips of a coin), selects 10% or 20% or some portion of names on that list, making sure he/she is not drawing from any letter of the alphabet more heavily than others. The researcher obtained stratum sample sizes by first obtaining a full list of all the members of the population for each of the six strata. The researcher did this to ensure that data is obtained from enterprises that have embraced Technology Transfer in their day to day operations.

Purposive Sampling was also used for this study. According to Maina (2012) the purposive sampling technique allows the researcher to use cases that have the required information with respect to the objectives of the study. The researcher on this basis identified Catering MSEs that had embraced technology transfer in their operations. One enterprise was picked from each of the six stratums through purposeful sampling. Managers were then given questionnaires to complete.

3.4 Sample size

According to Mugenda and Mugenda (2003) when the population size is more than 10,000 the sample size n is calculated as follows:

$$n = \frac{z^2 pq}{d^2}$$

n= desired sample size
z=standard normal deviate at the required confidence level.
p= the proportion in the target population estimated to have the characteristics being measured.

q =1-p

d=level of statistical significance set

$$n = \frac{(1.96)^2 (0.5)(0.5)}{(0.05)^2} = 384$$

The total sample size calculated from the total population will therefore be Three hundred and eighty four catering MSEs. Formula for calculating the stratum sample size.

$$ns = n \times ps \quad ns = 384 \times \frac{x}{11162}$$

Where ns= Stratum sample size
n=size sample

$$ps = \frac{\text{Total number of MSEs. in stratum}}{\text{Total MSEs in the target group}}$$

Total sample for the whole population was 384

Table 3.2: Total licensed catering MSE's Stratum and sample sizes in Nairobi.

Code Stratum	Population	Sample size
543: Medium Restaurant with bar/Membership club	1,234	43
546: Small Restaurant with bar/Membership club	1,327	46
549: Mega eating house, Snack Bar, Tea House "Hotel"	667	23
552: Medium eating House, Snack Bar Tea House "Hotel"	1,445	50
555: Small eating House, Snack bar, Tea House	5,673	195
595: Other Catering and Accommodation	776	27
Total	11,162	384

The stratum sample sizes have been rounded to obtain whole figures.

3.5 Data collection Instruments

Secondary and primary data were required for this research. Secondary data was obtained from online, print-outs, journals, websites, books, articles and through communication with experts through the mobile phone technology. Primary data was obtained from owners of MSEs through self-administered survey method of data collection. The following instruments were used as testing devices.

Questionnaires were the main instrument of data collection. According to Mugenda and Mugenda, (2003), questionnaires are used to obtain important information about the population. Each question in the questionnaire was developed to address a specific objective, research question or objective of the study. Questionnaires were prepared for use in the sampled catering enterprises. The questionnaires had different sections as follows: Part A: General and demographic data, Part B: The influence of production technology transfer, Part C: The influence of Equipment and object technology transfer, Part D: The influence of knowledge technology transfer, Part E: The influence of process technology transfer. Part F: The role of production skills,

equipment, knowledge and process embodied TT on Catering MSEs growth.

The interviews helped the researcher probe the respondents so as to get more details on the subject under study.

The questions for the interview were both structured and unstructured. Structured questions with a list of all possible alternatives from which respondents selected the answers that best described their situations were used. They were then administered for completion by enterprise owners. Questionnaires detailing all the variables of the study with open spaces for comments were used for the study. In order to yield qualitative data, open ended questions were also used.

An interview guide was used in this study as it was flexible and enabled the researcher to collect large amounts of information that would otherwise not have been available. According to Mugenda and Mugenda (2003) a study can use both structured interview guides and unstructured interview guides. According to Maina (2012) a trained interviewer can hold the respondents attention and can also clarify a few issues during the interview. An interview schedule ensured that standard data was obtained from all the Catering MSEs within the sample. All the Catering MSEs owners/managers who were the respondents of this study were booked by telephone for interview appointments in advance. Interviews were conducted in person at an agreed time where an appropriate venue within the micro and small catering enterprise was identified and used for the interview.

A training session was organized on 20th April, 2015 for the assistants on data collection before they proceeded to the field on 2nd May, 2015. The research instruments were then pre-tested and adjusted accordingly. The data collection exercise commenced on 8th May, 2015 until 30th July, 2015. The researcher followed up the assistants closely during this period for feedback and co-ordination to ensure that the exercise went on as planned. Twenty respondents from the population completed the questionnaires for the purpose of pilot testing. The data collected each day was stored appropriately awaiting analysis.

3.6 Margin of error

According to Mugenda and Mugenda (2003) the margin of error is the statistical concept which expresses the discrepancy between the characteristics of the population and the characteristics of the sample, although the sample is drawn from that population. The Confidence level for this study was 95 percent (0.95).According to Saunders *et al.,* (2009) if any sample is selected 100 times at least 95 percent of the samples would represent the characteristics of the population. The margin of error for the study was therefore 5 percent (0.05). The standard normal deviate at 95 percent is 1.96 (Z value) as shown in Table 3.2.

Table 3.3 Levels of confidence associated with values

Level of confidence	Z value
90% certain	1.65
95% certain	1.96
99% certain	2.57

Source: Saunders *et al.,* (2009)

3.7 Pilot Test

Pilot testing was done on the research tools in order to take note of any ambiguity so as to refine the research instruments. The researcher administered a set of structured and unstructured questionnaires through pilot study so as to appraise the questionnaire appropriateness and to be able to estimate the time required for the study. Fleiss (1986) asserts that it is imperative that instruments for data collection be as accurate as possible. This enabled the researcher to refine, redesign and re-write the questionnaire where it was necessary with the help of peers who have in-depth knowledge in statistics. The interview guide was adjusted to ensure that all the required information was captured.

3.8 Reliability

This is a measure of the degree to which a research instrument yields consistent results after repeated measurements are taken of the same subjects under similar conditions (Gay, 1992). In this study, reliability of the research instrument was tested using the split half design. Mugenda and Mugenda (1999) observe that this design requires a single testing and has the advantage of eliminating chance error due to differing conditions. The following was done as outlined by Mugenda and Mugenda (1999). Items from the domain of indicators that measure a given variable, for instance higher income, are sampled. The instrument is then administered to the pilot group. The split half model then splits the scale into two parts into which the responses are assigned randomly and the correlation between the two parts is examined. This yields Cronbach Coefficient Alpha for each half. The average is taken to measure reliability of the instrument (Cronbach, 1951).

3.9 Validity

This refers to the extent to which the research design and the data that it yields allows the researcher to draw accurate conclusions (Leedy, 1997). To ensure internal validity, especially when qualitative approaches are used, triangulation of the methods of data collection is recommended (Leedy, 1997). In this study triangulation method of data collection methods (questionnaires and interview schedules) were used.

Principal component factor analysis was used prior to undertaking multiple regression analysis in order to establish the few independent variables with the strongest effect on enterprise growth from among the X1-X5 variables. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's test of Sphericity was carried out before factor analysis. Bartlett's Test of Sphericity was used to test the null hypothesis that the correlation matrix upon which the factor analysis was based is an identity matrix. An identity matrix is that in which all of the diagonal elements are 1 and all of diagonal elements are 0. For the KMO, usually a value of 0.6 is a suggested minimum, Tabachnick and Fidell (2001). On the other hand if The Null Hypothesis that the Correlation matrix is an identity matrix was accepted, the sample data was not good for factor analysis.

3.10 Common Method Bias

According to Creswel (2007) Common Method Bias refers to the degree to which correlations are altered (inflated) due to a

methods effect. In this study, bias may occur if the respondents are required to respond to the questionnaires simultaneously. The researcher designed different questionnaires for the dependent and independent variables of the study. These were administered at different times. The researcher ensured prolonged engagement with the respondents within the Catering MSEs to check for any misinformation that may stem from the researcher or instrumentation and made decisions about what is salient and relevant to the study. The research instruments were also varied so as to minimize the Common Method Bias in the study.

3.11 Data Collection Procedure

The document analysis checklist was used to collect secondary data from micro and small catering enterprises, while questionnaires were used for collecting primary data. Secondary data constitute information from already written sources. The researcher read several documents and recorded the data from them on the Document Analysis Checklist to assist in review of related literature and also to enrich and/or verifying the primary data during the compiling of the report. Primary data was gathered from respondents of various MSEs in the field after obtaining the Research Permit from National Commission for Science, Technology and Innovation. The researcher also developed the work plan and pre-tested the instruments through a pilot study (pilot run) was carried out in one firm in each of the six categories). It was also necessary to prepare enough copies of the instruments (questionnaires) ready for distribution.

The researcher visited the sampled 384micro and small catering enterprises in Nairobi County and administered the questionnaires to the enterprise owners, after establishing a rapport with each of them and explaining the purpose of the study and assuring them that the information they gave was confidential. This ensured a high response rate from the respondents. Data for this research was obtained from the 280 enterprise owners. Enough time was allowed to fill the questionnaires and after one week, they were collected. Cooper (1984) asserts that one of the ways to maximize questionnaires response as well as the return rate is by sending a preliminary notification about the questionnaires, and writing passionate requests for cooperation by the respondents.

The researcher obtained an introductory and authorization letter to carry out the research from the university (JKUAT). To this end the researcher made passionate appeals for respondents to cooperate by filling the questionnaires and then alerting the researcher for collection. In some cases the researcher had to travel to the establishments more than once to pick the questionnaires from respondents who begged for more time to complete the questionnaires or needed another appointment for the interview.

Once all the questionnaires were picked, the researcher was guided by the following order in processing and analyzing the data as presented by Creswell (2009). Sorting and arranging the data into different types depending on sources of information after which the researcher read through all the data to obtain a general sense of all the information obtained. A Codebook was then developed for data coding based on the research variables.

According to Mugenda and Mugenda (2003) data must be converted to numerical codes representing attributes or measurements of the variables for analysis. One numerical code

was assigned to each independent variable and each dependent variable. Enterprise growth was measured in terms size, age since inception, turnover, profit margins, output, quality, customer base and efficiency in relation to technology transfer of production skills, equipment knowledge and processes. The researcher used the code book to transfer the numerical numbers representing the responses from the questionnaires.

3.12 Data Processing and analysis

The nominal and ordinal data were collected using questionnaires and quantified from the qualitative data and was subjected to quantitative analysis applying descriptive and inferential statistics in line with the four research objectives. Descriptive statistics was used to describe the population characteristics numerically and hence more precisely in accordance with Saunders *et al.* (2007). The Inferential statistical analysis of the results were done to determine whether or not there is a statistical relationship established between growth (the dependent variable) and the independent variables on the basis of the research questions. Quantitative data obtained from the questionnaire was analyzed using statistical package for social scientists (SPSS) software package version 22.Qualitatively, thematic analysis, categories and patterns were used in interpretation of data. Graphs, charts and tables were used to present descriptive data analysis results. Descriptive statistics such as measures of central tendency was used to describe levels of dispersion. The relationship between independent variable(s) Technology Transfer and the Dependent variable (Enterprise growth) as per the findings of this study was determined based on hypothesis testing and regression analysis.

Correlation analysis was done to establish the relationship between the variables. Correlation analysis measures the extent of interdependence where two variables are lineally related. (Namusonge, 2010).If variables are correlated then a change in one variable is accompanied by a proportionate change in another variable. If variables are independent r =0, if dependent then r=1.If the value of R is close to 1 then it shows a strong correlation between the variables. If the value of R is close to 0 then it shows the association is weak (Namusonge, 2010).Analysis of Variance (ANOVA) was used in this study as it allows for test of significant difference in two or more groups. The test was also used in the study to measure variations within the groups.

The study used the Logistic (or Logit) regression to establish the effects of the independent variables to enterprise growth. According to Mugenda (2012), this method of analysis is a statistical procedure where the dependent variable is measured at the nominal or ordinal levels with only two response categories such as yes or no. The equation being $\text{Log}(p/(1-p))$ .In this study, the researcher used the above equation as the logistic transformation of the probability P, written as Logit (P) short for logistic unit. The counted proportion P only lied between 1 and 0 to predict how the technology transfer of production skills, equipment, knowledge and processes have affected the growth of catering MSEs in Kenya.

The logit of a number p between 0 and 1 is given by the formula:

$$\text{logit}(p) = \log\left(\frac{p}{1-p}\right) = \log(p) - \log(1-p) = -\log\left(\frac{1}{p} - 1\right).$$

Logit (Growth) = $\beta 0 + \beta_1$Production skills+ β_2 Equipment+ β_3 Knowledge+ β_4 Process

Where, $\beta_0, \beta_1, \beta2, \beta_3, \beta_4$ are model parameters

According to Mugenda (2013), qualitative research generates voluminous amounts of data that can sometimes be overwhelming to the researcher. The data therefore needed to be carefully organized and analyzed to answer the research questions. The chi-square test was used to determine whether an independent variable is a factor influencing the dependent variable or not (Mugenda & Mugenda, 2008). This test was used for each of the independent variable over the dependent variable. The model was fitted on the basis of the explanatory variables determined by inferential statistics. Qualitative analytic reasoning process was used to interpret and structure the meanings that could be derived from the data.

3.13 Summary of the methods of testing the hypothesis
The logit regression model was used in predicting P, which was determined by the independent variables.

The general hypothesis to be tested was;

Ho: Technology transfer has no statistical significant influence on enterprise growth)
          Vs
Hi: Technology transfer has a statistically significant influence on enterprise growth.

If the P value associated with the above test is < 0.05, the Ho was accepted. The Xi was considered to have significance on Y. If the P value associated with this test was above .05, the Ho was rejected.

3.14 Measurement of the independent variables
The influence of the five independent variables was measured against the production and service output, production and service quality, efficiency of production and service, employee satisfaction, customer volume, enterprise profits and the size of the enterprise.

3.15 Measuring of the dependent variable.
When researching factors affecting growth it was necessary to first define how firm growth and growth would be measured. Various indicators are used to measure growth and there doesn't seem to be any general measurement. Measuring sales growth and relative employment growth during a specific time period are the most common indicators used. Indicators such as assets,

market share, profits and output are also commonly used, however not as commonly as sales and employment. Output and market share vary greatly within industries and is therefore hard to compare, total assets also depends on the industry's capital intensity and changes over time and profits is not that relevant unless measuring size over a long period of time. Therefore sales and employment are the two most important indicators measuring firm's size and growth. Employment numbers is also a measure that is easily accessible, since it is an important figure for governments. Sales figures are on the other hand affected by inflation and exchange rates and it is difficult to compare sales figures between industries. That is why it is important to use multiple growth indicators to study firm growth (Davidson, Delmar & Gartner, 2006).

According to Evenson and Westphal (2006) enterprise growth is the development process where enterprises keep the tendencies of balanced and stable growth of total performance level (including output, sales volume, profit and asset gross) or keeps realizing the large enhancement of total performance and the stage spanning of development quality and level. In this study growth was measured against the total performance in the speed of output where more units are produced and more customers are served within a given time with quality products and services. The increase in the number of customers that were served over a given time was used as a growth indicator. The researcher looked at the increase of the number of customers served in each year since the inception of the enterprise. The increase in net profits over each year was an indicator of enterprise growth over the same period. Employee satisfaction and turnover over the same period was also used as a growth indicator. An enterprise that is able to retain the same employees over a given period is a clear indicator of improved working conditions and positive growth over the same period. Opening up of new micro and small catering outlets over the same given period indicated growth.

IV.   FINDINGS ON THE ROLE OF KNOWLEDGE EMBODIED TECHNOLOGY TRANSFER AND GROWTH OF MICRO AND SMALL CATERING ENTERPRISES

4.1 The Role of Knowledge Embodied Technology Transfer and Growth of micro and small catering enterprises
One of the variables that influence the growth of micro and small catering enterprises is the technology transfer of

knowledge. This view was supported by a majority of respondents (81.5%) who indicated that technology transfer of knowledge have had a role to play in production in micro and small catering enterprises(see Table 4.1). The new knowledge gained by participating micro and small catering enterprises was measured by academic level achieved by firm owners and employees.

Table 4.1: The Role of Knowledge Embodied Technology Transfer

Statements	Frequencies (%) N=280	
	Yes	No
Academic level is a major factor for employment in the enterprise	71.4	28.6
Academic level ensures food production and service methods are standard	82.5	17.5
Academic level ensures food production and service is fast	80.4	19.6
Academic level enhances efficiency in production and service methods	82.1	17.9
Academic level increased customer satisfaction	81.1	18.9
Knowledge enhanced service quality	82.1	17.9
Academic level enhanced quality products	83.1	16.9
Academic level improved overall performance of organization	81.8	18.2
Academic level enabled workers increase output	80.7	19.3
Academic level has led to growth of output	81.1	18.9
Academic level has led better production methods	82.9	17.1
Academic level enabled organization grow in terms of customers	82.1	17.9
Academic level played role in growth of organization	78.6	11.4
Average	81.5	18.5

Majority of respondents (82.5%) felt that high academic level ensures food production and service methods are standard, ensures food production and service is fast(80.4%), enhances efficiency in production and service methods(82.1%) , increases customer satisfaction (81.1%), service quality (82.1%) and quality of products (83.1%). In addition, academic level improves overall performance of organization (81.8%), increases output of workers (80.7%), enhances growth (81.1%), improves production methods and it increases the number of customers (82.1%)

These dynamic processes of creating, combining and sharing information are a key to generate new knowledge (Bathelt, et al., 2003). These findings are also consistent with Cohen and Levinthal (2004) who argue that the capacity to make use of external knowledge is a function of the level of prior related knowledge.

4.2 Effect of Knowledge Embodied Technology Transfer and micro and small catering enterprises

As noted earlier in a section of this study, interviewees who contributed in giving information noted that majority of micro and small catering enterprises had embraced the importance of investing in education as part of enhancing growth. Participants using a questionnaire were asked to say yes or no academic level of employee had any effect on some growth indicators (see Table 4.2). On average, of the total number of respondents selected for the current study (n=280), 82.5% agreed that academic level of employees had some positive effects on growth variables.

Table 4.2: Positive effect of academic level of employees

Positive Effect of Academic Level of Employees on :	Frequencies (%) N=280	
	Yes	No
Quality of products	84.6	15.4
Quality of service to customers	83.6	6.4
Profit establishment	82.5	17.5
Customers per day	81.8	18.2
Speed of production	82.1	17.9
Efficiency of employees	83.2	16.8
Satisfaction of employees	82.1	17.9
Rate of output per hour	83.6	16.4

Overall performance	79.3	10.7
Average	82.5	17.5

One of the positive effects of academic level of employees is its role in enhancing quality of products as stated by 84.6% of respondents. This view was shared by one of the key informants who said that with new knowledge, firm owners are able to adopt varying methods aimed at improving quality of goods and services. Academic level of education was also noted to enhance the quality of service to customers (83.6%), increased profit establishment (82.5%), increased customers per day (81.8%), improved efficiency of employees (83.2%), and enhances satisfaction of employees (82.1%) and the overall performance of the firm (79.3%). There are several ways to increase the knowledge and competence, e.g. education, recruitment, through consultants and e-learning (Cornia, 2002). According to Foray (2004), knowledge is absorbed by another person or a group than the inventor, is used in new dimensions and this stimulates economic growth.

4.3 Effect of Experienced and Well Trained Employees on Production Processes

An informal discussion with one of the key informants revealed that well trained employees in micro and small catering enterprises changes has taken place from the old methods of production to faster, new and modern methods with higher production outputs that can serve a wider market. In addition, questionnaires utilized with firm owners endeavored to find out whether there is any positive effect of experienced and trained employees on enhancement of production processes. On average, majority of firm owners (84.2%) believed that trained employees enhances production processes in micro and small catering enterprises. This information is presented in Table 4.3.

Table 4.3: Positive Effect of Experienced and Well Trained Employees on Production Processes

Statements	Frequencies (%) N=280	
	Yes	No
Methods of production improves	84.6	15.4
Enhances Better and faster processes	83.9	16.1
Adopts Processes that are fast and simple	82.6	16.1
Number of customers serviced per day increases	84.6	15.4
Speed of production is enhanced	84.3	15.8
Efficiency of enterprises improves	83.8	16.2
Satisfaction of the employees is enhanced	84.6	15.4
Rate of output per hour increases	84.5	15.5
Overall performance is enhanced	83.9	16.1
Average	84.2	15.8

The results presented in Table 4.3 show that experienced and well trained employees have had positive effects in enhancing production processes in micro and small catering enterprises. Some of the positive effects is that use of experienced and well trained employees have improved methods of production (84.6%),enhances better and faster processes (83.9%),assumes processes that are fast and simple (82,5%), new processes increases the number of customers per day (84.6%), the speed of production is enhanced (84.3%), enhancement of firms efficiency (83.8%), enhances satisfaction of the employees (84.6%) ,rate of output per hour increases and overall performance is enhanced (83.9%).

4.4 Knowledge Embodied Technology Transfers and the Growth of micro and small catering enterprises in Nairobi, Kenya

The objective of this study was to examine how knowledge embodied technology transfers have influenced the growth of micro and small catering enterprises in Nairobi County- Kenya. The respondents were asked to indicate the role of technology transfer in knowledge and how this influences the growth of Catering Enterprises in Nairobi County- Kenya. The responses were measured on a dichotomous scale 'yes' and 'no' with yes= 1 and no= 0.

4.5 Factor Analysis on knowledge embodied Technology Transfer

Knowledge embodied technology transfer contained twenty four items which were reduced to form two components. The reliability test with Cronbach Coefficient on all the twenty four items showed internal consistency with alpha coefficient beyond the marker of .6(á=.986).

The factor analysis extraction method: principle component was also used to validate the data using Varimax rotation method with Kaiser Normalization. The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy was beyond the minimum value of .5 (KMO=.937) indicating that the sample size was adequate for factor analysis. The Bartlett's Test of Sphericity was statistically significant at .001 level (χ^2=12374.639, DF=276, p=.000) a proof that the variables are sufficiently correlated. Rotation converged in three iterations as can be observed in the Rotated Component Matrix table.

Table 4.4 Knowledge Embodied Technology Transfer Total Variance Explained

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	18.614	77.558	77.558	18.614	77.558	77.558	10.338	43.074	43.074
2	1.203	5.011	82.569	1.203	5.011	82.569	9.479	39.496	82.569
3	0.704	2.931	85.501						
4	0.606	2.526	88.026						

Extraction Method: Principal Component Analysis.

Two components were extracted using factor analysis with Eigen values exceeding unity and accounting for 82.569% of the total variance (See Table). This is beyond the threshold of 50% thus showing that the two factor model could be used for the data. Items loading above .5 for every component were grouped to form two factors. The structure matrix of the two factors with their loadings is presented in Table 4.5.

Table 4.5: Knowledge Embodied Technology Transfer Rotated Component Matrix

Item description	Component	
	1	2
Academic level is a major factor for employment in the enterprise	.640	.377
Academic level ensures food is produced and served on time	.766	.432
Academic level ensures food production and service methods are standard	.811	.459
Academic level ensures food production and service is fast	.818	.430
Academic level enhances efficiency in production and service methods	.795	.543
Academic level increased customer satisfaction	.801	.452
Knowledge enhanced service quality	.730	.314
Academic level enhanced quality products	.790	.433
Academic level improved overall performance of organization	.818	.493
Academic level enabled workers increase output	.809	.458
Academic level has led to growth of output	.790	.424
Academic level has led better production methods	.774	.499
Academic level enabled organization grow in terms of customers	.784	.474
Academic level played role in growth of organization	.498	.575
Production techniques have changed over time	.313	.555
Quality of products	.498	.830
Quality of service to customers	.492	.824
Profit establishment	.461	.791
Number of customers served per day	.507	.792
Speed of production	.456	.852
Efficiency	.480	.827
Satisfaction of employees	.480	.821
Rate of output per hour	.457	.849
Overall performance	.433	.775
Reliability coefficient: Cronbach alpha(overall= .986)	.982	.971

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations

The two components were then re-named as Academic Status (component 1) and Effects of Academics (component 2). These components were named depending on the concepts or constructs they measure. The first component corresponding to Academic Status with thirteen items included constructs that assessed whether Academic level is a major factor for employment in the enterprise, ensures food is produced and served on time, ensures food production and service methods are standard, ensures food production and service is fast, enhances efficiency in production and service methods, increased customer satisfaction, enhances service quality, enhanced quality products, improves overall performance of organization, enables workers increase output, has led to growth of output , led better production methods and enable organization grow in terms of customers.

The overall mean score of acceptance for academic status is 10.485 (STD= 4.63) with a majority of owners (n=248, 86.4%) underscoring the importance of academic status in technological transfer of knowledge. The results show that acquiring high academic status is essential for effective knowledge technological transfer in catering services in micro and small catering enterprises. This finding extends Gibson (1990) argument that the most effective way to accomplish technology transfer is to transfer the people with the requisite knowledge to the arenas where that technology is needed. The reliability test with Cronbach Coefficient on the twelve items showed internal consistency with alpha coefficient beyond the minimum of .6(á=.982).

The second component factor loadings were denoted as 'Effects of Academics' variable.

Eleven items that loaded on 'Effects of Academics' variable had statements that explored the extent to which academic achievement played role in growth of organization, production techniques have changed over time, quality of products and services to customers have improved, profits have been realized, increase of the numbers of customers per day and Speed of production, enhancement of efficiency ,satisfaction of employees ,increase of rate of output per hour and improvement of overall performance. Descriptive statistics on the acceptance of this variable indicates a mean of 9.05 (STD=3.878) with a majority of enterprise owners (n=253, 90.4%) believing that achieving high academic levels is the most effective means to acquire requisite knowledge to the areas where that technology is needed.

These results show that academic achievements have positive effects on technological knowledge and skills to firm through the numbers of people required in the work place to ensure that the technology is successfully "transferred" and efficiently used. According to (Phillips *et al.,* 2002) Capacity transfer includes provision of the know-how and software not simply to manufacture existing products but, more importantly, to innovate and adapt existing technologies and products, and ultimately design new products. The reliability test on all the items in this variable was above the minimum limit of .6(α=.971).

A binomial logistic regression was performed and this predicts the probability that an observation falls into one of two categories of a dichotomous dependent variable based on one or more independent variables that is categorical or continuous In this study, logistic regression was used to find out the influence of a number of predictor variables on the likelihood that firm owners would indicate that Micro and Small Enterprises had experienced certain level of growth.

A binomial logistic regression was utilized in this study since it is the appropriate technique where the dependent variable is dichotomous or categorical and the independent variables are either categorical or continuous. In this study, the dependent variable (growth levels) was categorical (growth or no growth).

The logistic regression model contained two component factors, namely; Academic Status and Effects of Academics. The logistic regression model was summarized and fitted as:

Logit (level of growth) =-1.555+ .173 (Academic Status) +.190 (Effects of Academics).

Table 4.6 A summary of Variables in the Equation

Components	B	S.E.	Wald	Df	Sig.	Exp(B)
Academic Status	.173	.072	5.774	1	.016	1.189
Effects of Academics	.190	.086	4.879	1	.027	1.209
Constant	-.826	.342	5.851	1	.016	.438

n=280
χ^2 = 88.195; df = 2; Sig. = .000.
Cox and Snell R square (.270); Nagelkerke R square (.499)
Overall percentage correct prediction (86.8%)

The general model was significant at .05 levels (χ^2 = 88.195; df = 2; Sig. = .000, n=280) indicating that the logistic regression model was able to distinguish business owners who realized firm growth and those who did not report any growth in Nairobi County, Kenya. The explained variation in the dependent (levels in growth) variable based on the above model ranges from

27.0% to 49.9 %(Cox and Snell R square =.270; Nagelkerke R square =.499) and correctly classified 86.8% of cases.

The Wald test was also used to determine statistical significance for each of the predictor variables. From these results, it is noted that the two test variables Academic Status (*p* = .016) and Effects of Academics added significantly to the model/prediction. The results show that the odds of achieving positive growth ('yes' category) are 1.189 times greater for firms with high academic status than those without. The results also show that the odds of achieving high growth are 1.209 times for firms with positive Effects of Academics than those without. These results show that Micro and Small Enterprises, whose owners had enhanced technology transfer of knowledge, achieved positive growths levels.

The above findings are consistent with findings of case studies on the influence of technology transfer of knowledge and the growth of micro and small catering enterprises. For instance, Phillips et al. (2002) attributes general failure of most MSEs to low educational achievement. In addition, even where firm owners develop interest in new technology, their limited education adversely affects the absorption capacity of acquired technology (ILO, 2005). A challenge for developing countries is to facilitate temporary movement abroad and to encourage returnees to undertake local research and business development.

This school of thought is supported by Cornia (2002) who cited several ways to increase the knowledge and competence, e.g. education, recruitment, through consultants and e-learning. In contrast, Cohen and Levinthal (2004) argue that the capacity to make use of external knowledge is a function of the level of prior related knowledge. According to Bathelt, et al. (2003), this prior knowledge includes basic skills, shared language and also knowledge about the last scientific and technological developments.

V.   SUMMARY OF FINDINGS

Data analysis in this study was carried out using both descriptive and inferential statistics. The statistical package for social sciences (SPSS) Version 22 was used to run the data. Descriptive statistics for the study included means, standard deviations, frequencies and percentages. Inferential statistics used in the study included correlation and multiple regressions in order to determine the relation between the independent and dependent variables. Correlation technique was used in the study to analyze the degree of relationship between the independent and dependent variables while logit regression analysis was used to determine the effect of knowledge on the growth of micro and small catering enterprises. Data was also subjected to factor analysis. The Binomial Logistic Regression was also used to analyze the data. The study established that transfer of knowledge leads to the growth of micro and small catering enterprises in Nairobi County, Kenya. Growth was measured in form of profit margin, increase in employees, increase in customers, enlargement in firm size and enhancement in quality of products and services.

Since the study objective was concerned with the relationship between the independent and the dependent variable. Regression and ANOVA analysis were used to determine the

relationship between them. The results of the two show that there is a strong relationship between the independent variables of the study and growth. Micro and small catering enterprises that had embraced technology transfer of knowledge had showed a marked growth in terms of profit margins, increase in the number of employees, increase in customers, enlargement of firm size and improvement in the quality of both products and services over the past six years.

One of the positive effects of academic level of employees is its role in enhancing quality of products as stated by 84.6% of respondents. This view was shared by one of the key informants who said that with new knowledge, firm owners are able to adopt varying methods aimed at improving quality of goods and services. Academic level of education was also noted to enhance the quality of service to customers (83.6%), increased profit establishment (82.5%), increased customers per day (81.8%), improved efficiency of employees (83.2%), and enhances satisfaction of employees (82.1%) and the overall performance of the firm (79.3%).

Regarding the level of education, majority of firm owners (n=84, 30.0%) had attained a diploma level of education. This level was followed by owners with university education having a bachelor's degree (27.9%). Owners with Masters Degree were (3.2%) and owners with primary level of education were also few (13.2%).

VI.   CONCLUSION

The study can therefore, concludes that technology transfer of knowledge leads to the growth of micro and small catering enterprises in Nairobi County, Kenya. The growth is measured in form of profit margin, increase in employees, increase in customers, enlargement in firm size and enhancement in quality of products and services.

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