

Assessing the Influence of Formal Training Practices on innovation performance of Pharmaceutical Firms in Kenya

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Abstract: The study was conducted by exploring the influences of formal training practices as a component of innovation firm performance. It considered the influences of formal training practices as one of the factors of the innovation performance of pharmaceutical firms in Kenya. The choice of the pharmaceutical industry was thought to be suitable for study due to its knowledge-intensity nature. This research study applied an ex post facto research design aimed at achieving the objectives of the study. The population of interest in this case included a sample of pharmaceutical firms in the city of Nairobi involved in manufacturing in particular, and an input from those in marketing and distribution of prescription medicines. The population of interest for study constituted selected pharmaceutical firms in Nairobi. A sample of 163 respondents was thought to suffice for this study. A data collection form or questionnaires were used to collect data from respondents for analysis. Interview schedules and analysis of secondary data were also used. Quantitative data was analyzed by both descriptive and inferential statistical methods. For purposes of inference, regression model was performed on the variables (Formal training practices vs. innovation performance in Pharmaceutical firms.) All P-values were accompanied by a 95% confidence interval around the calculated odds ratio. Qualitative data was also analyzed. Data was presented in the form of tables, charts, figures and adopted an econometric approach to test the degree of correlation between the variables by employing the multiple regression analysis. Data was coded to facilitate analysis. It was analyzed with the aid SPSS software version 20. Data was categorized and arranged to determine how independent and dependent variables relate. The study findings indicated that there was a significant relationship between formal training and innovation performance of pharmaceutical firms ($p=0.003$). The study concluded that the variable formal training was found to be significant in innovation performance of pharmaceutical firms in Kenya. One of the recommendations is that further studies could be carried out on a formal training to enhance knowledge-driven culture within which innovations can be incubated and shared to enhance innovation and creative thinking.

Keywords: Formal training practices, Innovation performance, Pharmaceutical firms

I. INTRODUCTION

Various firms today aspire for good performance ranging from operations to profitability. However, the

impediment to such could be the lack or insufficient sharing of knowledge, information and good practices. Formal training practices could be some of the solutions of sharing and imparting knowledge. When this happens, then there is the likelihood of innovation performance. Governments believe that the present low factor productivity is due to the skill gap that when left on its own, the industry will provide less training than what is socially optimal (Inkinen *et al.*, 2015). Training, considered a practice, is a learning process that seeks to bring about long-lasting improvement in the ability and behavior of employees or practitioners by enabling them to learn new skills, knowledge, attitude and behaviour.

Formal training in a general sense refers to a planned effort by an organization to facilitate employees in acquiring skill, attitude and behaviour that are critical for successful performance on the job. In their study, Bhatti & Kaur (2010) considered the role of individuals and training design aspects on training assignment. Their paper offered the theoretical model of training transfer in which they came up with various factors that affect the training effectiveness. Among the identified elements included the transfer design, perceived content validity, performance personal ability, assessment of training and training transfer drive. This paper enhances their thoughts by specifically exploring the influence of formal training on performance of firms in the pharmaceutical sector. The study was carried out in Kenya. The researcher concluded that there is a substantial relationship between formal training and innovation performance in firms. This was also in agreement with Farooq and Khan (2011) who studied impact of training and feedback and concluded that the same increases the performance of employees. They detailed that training is a promoter for employees' performance improvement. Furthermore, they concluded that training and feedback can enhance the performance level of all types of the organizations. They posited that working independently or together training and feedback play their role in enabling firms to realize organizational targets by enabling their workers to become both task focused and goal oriented (Andries & Czarnitzki, 2014)

A. Literature review

Training and development are directly related to an employee, but its ultimate effect goes to an organization because the ultimate user is the organization itself. According to Shiferaw Mekonnen (2020), training also helps the organizations to understand which factors are important to keep in mind during the performance and how a good training can be delivered to their employees. Inkinen *et al.*, in their 2015 study found out that in Knowledge-based firms, training and development practices are positively associated with the firm's innovation performance. The study findings revealed further that providing training alone cannot bring livelihood changes. In essence, innovation performance must be the output of the training. Christopher Hanson (2014) posits that formal training in large businesses contributes to increased productivity, and ultimately increased organizational performance, but there is little research on the use of, or impact of formal training in small businesses. The lack of longitudinal data on the use of formal training in small businesses is one of the main stated reasons for the lack of research and understanding in this area.

B. Formal Training and Innovation performance

Employee training in this case refers to the level of schooling that workforce of the firm possess. The level of schooling of employees within a firm may benefit the firm, because education enhances the ability to understand, create and process information quicker compared to individuals without education (Nelson & Aghion, 2014). Furthermore, a workforce that has a certain level of schooling is better able to absorb knowledge and exploit opportunities compared to a workforce without any schooling (Cohen & Levinthal, 2015). Previous research in the agricultural sector in developing countries shows a positive relation between education and innovation (Knight *et al.*, 2013). Liu & Buck (2012) included the level of schooling to explain innovative output in China and found a significant effect as well. Hence, the level of schooling within a firm could be conducive in absorbing knowledge and transforming this knowledge into innovation.

Formal training is the extra training that employees receive from the firm in order to instruct employees in specific processes and learn enabling them to acquire specific skills and abilities. This increases the human capital of the firm by updating knowledge and capabilities of employees (Batarseh, *et al.*, 2017). Furthermore, if a firm intends to introduce a new product or service, the employees should learn new skills in order to produce these new products and services. Therefore, training of employees enhances the success of innovation (Freel, 2015). In low- and medium-technology industries for example, training seems to be crucial for innovation (Santamaría *et al.*, 2014). Yet, empirical evidence is not conclusive about the role of formal training. In their study, Caloghirou *et al.* (2014) did not find a significant effect of formal training in developed countries on the subject matter, whereas Santamaría *et al.* (2014) found a significant effect of

training on innovation in Spain. Goedhuys (2012) does not find a significant relation between training and product innovation in Tanzania. However, it is expected that there is a relationship which is positive and significant in developing countries, because formal training of employees can compensate for the lower grades of education of the same employees (Goedhuys & Sleuwaegen, 2010).

Uden, Knoben and Vermeulen, (2014) in their study on human capital and innovation in developing countries at a firm level, had very interesting findings. They examined whether human capital endowments of firms and additional practices of firms have a positive relation with the innovative output of firms. They considered aspects such as formal training and employee slack time. They made contribution to the literature of factors that influence innovation at the firm level and the literature about human capital and innovation at the national level. Furthermore, they studied this relationship in developing countries, while most studies about innovation have been done in developed countries.

Uden *et al.*, (2014) empirically tested the situation in Kenya, Tanzania and Uganda with statistics obtained from the Enterprise Surveys of the World Bank in which the outcomes exhibited a positive connection between human capital and innovation. Findings indicated that by firms by offering formal training and employee slack time, these were particularly thought to be conducive for innovative output. Dostie (2014) carried out a study on innovation, productivity, and training. For instance, the organization's ability to innovate is dependent on its stock of human capital and this important factor. This therefore follows that any increase in such a stock through firm-sponsored training can lead to further innovation.

The research tried the human capital theory by using detailed data on firms' human capital investment and innovation performance by utilizing the Canadian longitudinal study which linked employer-employee figures obtained from 2011-2014. Their results were based on workplace fixed-effects allowing for time-varying productivity shocks. Furthermore, the findings demonstrated that that added training leads to more product and process innovation, particularly on-the-job training playing a role that is as important as classroom training. There was therefore a clear demonstration that on-the-job training has a positive impact in particular on firm-level productivity through improved process innovation. Bauernschuster, Falck & Heblich (2014) argue that continuous training guarantees access to innovative knowledge and consequently an increase in firm's propensity to innovate. Accordingly, statistics of 2012 indicated that indeed the lack of skill within the enterprise is thought to be one of the two most frequently reported obstacles to innovation amongst Canadian firms.

Moreover, due to the fact that innovation is recognized as having a positive effect on firms' productivity (Crépon, Duguet & Mairesse, 2013), it is possible that the link between

training and productivity is partly through innovation. Bauernschuster et al, (2014) delivered some of the most substantial results that there is a positive influence of firm-sponsored training on innovation. These scholars established that such training has a positive and statistically significant impact on innovation in German firms over the 2012-2011 periods.

For instance their results reveal that a 10 percentage-point increase in training intensity translates into a 10 percentage-point higher tendency to innovate. Distinguishing between routine and radical innovation, they find that training only has an influence on routine.

They postulate that radical innovation is harder to achieve because it depends on the inherent abilities of the workforce such as creativity, inventive talent and working in teams. Additionally, they content that radical innovation being deemed as too risky, firms might favour training for routine innovation to keep up-to-date with technological progress. In recent times, González, Miles-Touya & Pazò (2012) studied approximately 10,000 Spanish manufacturing firms in the period 2011-2014 and established that worker training has a significant effect on firm innovation performance and that it also complements R&D. Utilizing a panel of nearly 1,000 French firms from 2011-2012, Gallié & Legros (2012) found significant effects of R&D intensity and training on patenting activities.

Duguet & Mairesse's (2013) hypothetical model of innovation underscore the role of knowledge capital. Furthermore, the models of internal growth such as those described in Aghion and Howitt (2014) classically place a huge importance on education as compared to firm-sponsored training. Recent empirical evidence also points toward tertiary education as having a more meaningful impact on innovation than less advanced degree (Aghion, Boustan, Hoxby, and Vandenbussche, 2014). Employees are major assets of any organization. The active role they perform towards a company's achievement cannot be underrated. Consequently, investing in these unique assets through effective training is vital in order to maximize their job performance. There is also a need to position them appropriately so that they face the challenges of the today's competitive business environment.

It would appear that whereas extensive research has been conducted in the field of Human Resource Management, the same has not happened to employee training particularly in developing countries (Nassazi, 2013). In a study on the effects of training on employee performance, evidence from Uganda by Nassazi (2013), the results were found to be very interesting. For instance, the purpose of the study was to evaluate the impact of training on how employees performed, in the case of telecommunication industry in Uganda. For the purpose of clarity of the study's goals, four objectives were established and they concentrated particularly on identifying the training packages existing in the industry, the purpose of the training offered, and the methods engaged and lastly the

influences of training and development on employee performance. The study was conducted on three cases of the biggest telecommunication companies operating in Uganda at that time.

A qualitative research approach of the data gathering was adopted using a questionnaire involved 18 questions administered to 120 respondents. By using the results of this sample, there was an indication that training has a strong effect on the performance of employees. The main drive of training therefore, is meant to enable one acquire and improve knowledge, skills and attitudes to help in working and related responsibilities. As it were, training is one considered to be one of the most important potential influences which can result into a firm gaining in the short-term as well as in the long-term. There are so many benefits associated with training. Cole (2011) condenses these benefits to include high morale for employees who receive training since their confidence and motivations improve. Costs of production are likely to be lowered. The reason for this is that training reduces risks due to the fact that trained personnel are able to make better and profitable use of material and equipment thereby reducing and avoiding waste. Turnover is also lowered in that training brings a sense of security at the workplace effectively reducing labour turnover. Additionally, absenteeism is avoided and change management in the firm manages training which helps to manage change by increasing the understanding and involvement of employees in the change process (Ayalew & Zeleke, 2018).

This process also provides the skills and abilities needed to adjust to new situations; provide recognition, enhanced responsibility and the possibility of increased pay and promotion; help to improve the availability and quality of staff. The expectation is an improvement of staff performance. Wognum (2011) posits that training and development needs may occur at three organizational levels. They could be at strategic level where they are determined by top management while considering organizations objectives of mission, strategy and problems. This can be fixed at a tactical level where needs related to middle management are determined by considering developments necessities. Then there is the level where coordination and cooperation between organization units and operational level operate. At this level, the needs are determined with lower level management and other employees by considering problems related to the operations such as performance hitches of individual workers and the concerned departments.

In order to facilitate a firm to come up with human resource training and development objectives, something must be done; training must be packaged. When this happens, it might enable both formal and informal human resource training to be conducted. This kind of development methods and programmes create a workforce that facilitates effectiveness and competitiveness for an organization. This is worth giving it a consideration by providing proper coordination in addition to properly incorporating the needs within the three levels.

Wright & Geroy (2011) note that employee competencies change through effective training programs. It does not only improve the overall performance of the employees in effectively accomplish their tasks present jobs but also it boosts their knowledge, skills attitudes which are necessary for the future operation in contributing to superior firm performance.

Guston (2016) established that there is a widespread acknowledgment that the sheer presence of highly scientific as well as technical knowledge and the corresponding production, transformation into prototypes does not automatically lead to innovation which includes commercialization of products and processes. According to Lundvall (2013) some of the crucial elements that translate formal training into innovation are the ways in which skills and expertise are developed and used by individuals and organizations. Formal training is generally referred to as innovative competences. This may be considered as the combination of knowledge, skills and expertise. Guston (2016) added that firms must focus on these core competencies in order to exploit emerging markets and create new markets and increase their innovation performance.

Narin, Hamilton, & Olivastro (2017) noted that formal training from an innovation system perspective is one of the most important aspects of the process by which competences are created, maintained, and developed. Formal training is more apparent when innovation is kept in mind. Innovation performance is not solely an issue of commercialization of products but also an issue of providing specific novel solutions to complex socio-economic problems poverty, in a mediated way. Hence, firms and other innovating organizations have a wide diversity of needs in terms of the formal training requirement to keep them at the frontier of market competition, or at the frontier of problem solving. According to Michie & Sheehan (2013) formal training encourages firm innovation performance through its disposal, as well as the traditional mechanisms and processes of competence building associated with them. Formal training is stock concept and competence building is a flow concept and there is a distinction between individual training and organizational competences.

Narin *et al* (2017) posit that formal training is the acquisition of information, knowledge, understanding and skills by individual people, through participation in some form of education and training, whether formal for example in educational institutes or informal for example competence building learning-by-doing in the workplace. Formal training is as a result of individual competence building in an increased stock of human capital. Individuals exert substantial control over the firms' human capital (Teece and Pisano 2014). The firm, where an individual is employed, can profit from the latter's human capital only as long as the employee continues in the firm's employment; as he or she may leave at any time. All firms operate under the threat that their most skilled workers may leave for an opponent, or may create a

competing firm, once they have acquired experience and built up a contact network. Employee ownership programmes and stock option programmes are utilized to tie key employees to the firm and are therefore becoming more common (Mohnen & Dagenais 2014). The influence of balance among some employees, expressed in terms of their significant abilities and the owners and managers of firms has transformed because of the increased significance of human capital in the current economies.

Formal training may be internal or external to the firm/organization (Mowery and Rosenberg 2014). Internal sources of formal training are often developed by the firm, but they may also be acquired by the firm from outside. Regardless of their origin, they might become an integral part of the firm. According to Carneiro (2013) formal training is perhaps one of the most crucial areas in an innovation system, thus it is the quality and organization of primary, secondary and tertiary education. Whereas this training may occur externally, the results of it can be acquired by firms. The precise method in which the various levels and types of formal education that can affect innovation performance in an innovation setup is still partly contentious and open to research. A number of studies have concentrated on the relationship between educational levels and quality of education on the one hand, and economic growth on the other. But few have related these to innovation performance. In countries where an investment has been made in the quality of mathematics and science education at all levels (primary, secondary and tertiary) there is likelihood that performance may be better in innovation terms (Varsakelis, 2016). There are yet studies showing the cumulative interaction between the development of new products and services with the levels of skills in the labour force (Toner, 2014).

One of the leading concerns from the viewpoint of the innovation system is the level to which the entire educational system is able to produce the kind of knowledge, skills and expertise that innovative firms may require (Toner, 2014). In this regard, there seems to be a growing consensus that, not only is primary, secondary and tertiary education crucial for the attainment of adequate levels of literacy, mathematical and science skills in a country, but education is also crucial for the development of 'softer' skills that firms need, such as communication or inter-personal competences etc. These softer skills are becoming important complements to 'hard' skills, particularly in enhancing creativity and new modes of approaching problems inside the organization, as well as in the higher interconnectivity in the globalized economy and society (Lam, 2015). In a recent study, some soft skills were identified as very important for innovation. These skills involved sense of humour in communication, social intelligence, innovative and adaptive thinking, cross-cultural competency, and also computational thinking. Additionally, there were new media literacy, trans-disciplinarily, new design mindsets, cognitive load management and virtual collaboration (Davies *et al.* 2014).

Leiva and Brenes-Sanchez (2018) studied the influence of knowledge related to innovation performance. In their study, they assessed knowledge relatedness as a possible determinant of firm innovation performance. Knowledge relatedness is understood as the relationship of similarity between a firm's knowledge and that of its parent organization that is the company that the entrepreneur leaves to establish his or her own firm. This means that Innovation performance results from the competitive position that the company achieves through its management of new products and services in the market. This study reported a positive and significant association between knowledge relatedness and innovation performance for a number of fledgling firms.

C. Firm Innovation performance

Innovation is normally shown as a function spurred by structure, for instance institutions, assume access to existing knowledge. This is a very important process especially to the entrepreneurial performance. Innovation similarly suggests that the stock of useful knowledge increases in terms of value. In other words, innovation is one vehicle that diffuses and upgrades already existing knowledge, thereby serving as a channel for realizing knowledge spillages. The progression of innovation is consequently considered to be one of the critical issues in comprehending entrepreneurial performance (Norbäck & Persson, 2010). Although advances have been made towards the area of economics, a number of basic questions related to the dynamics of the growth processes, and the subsequent normative conclusions, are only partly understood and just barely explored. Even quite basic issues, as the definition of the concept of innovation are clearly not settled, not to mention how they come about and by whom, that is the connection to entrepreneurial activities.

Likewise, the question of how precisely innovation contribute to new knowledge (through scientific/technical discoveries), or through a much broader view on innovation has not been settled. Again there is the issue of which knowledge bases and cognitive abilities are critically important for innovation to take place. The Exact nature on how innovation corroborate into growth and how its effects are spatially diffused, which policy measures to be taken in order to boost the probability of sustained knowledge based growth, are among outstanding matters.

Those are the questions that must be dealt on in this paper through a selected survey of the literature and information. The lack of detailed insight into these issues may imply that the knowledge concerning the microeconomic foundations of entrepreneurship could be basic, or else it could also be considered to be quite flawed. Accurate microeconomic specification of the growth model is required in order to forestall the obvious risk that the derived policy implications could be incorrect. The recipes for growth of entrepreneurship are likely to be inconsistent over time and also vary over different stages of economic development.

The developing countries may learn from policies previously pursued by the developed countries. Much as the developed countries face a difficult task in modeling out growth policies for the future, the relationship between the level of development, entrepreneurship, innovation and growth still remains to be considered.

Firm innovation performance is one of the fundamental instruments of growth strategies that entities can use to enter new markets, increase the existing market share and provide the company with a competitive edge (Henderson & Clark, 2016). Challenged by the increasing competition in global markets, firms have started to acknowledge the importance of innovation. This is partly due to the rapidly changing technologies and intense global competition which rapidly erodes the value added to existing products and services. According to Jansen, Tempelaar, Van Den Bosch, & Volberda, (2013) firm innovation performance constitute an indispensable component of the corporate strategies for several reasons such as applying more productive manufacturing processes, to perform better in the market or seeking positive reputation in customers' perception. This in return may enable firms to gain sustainable competitive advantage. Innovativeness for instance has turned into an attractive area of study. This relates particularly for those researchers who have tried to define, categorize and investigate its performance impacts, mainly due to its practical relevance. Innovation performance provides firms with a strategic orientation to beat the issues they encounter while striving to realize sustainable competitive advantage (Zheng, *et al.*, 2019).

Bulle Ibrahim (2016) intended to determine the practice of material possession protection by the pharmaceutical manufacturers in Kenya and to work out the link between material possession protection and innovation performance within the pharmaceutical manufacturing industry in Kenya. The study relied on four main theories namely utilitarian theory of material possession, theory of innovation, dynamic capabilities theory and theory of competition. The study involved a descriptive research design. In this study, the targeted groups included all pharmaceutical manufacturing firms listed by the pharmaceutical society of Kenya. Primary data was employed in the study. The study used a structured questionnaire to gather the needed data. The questionnaire had three parts to assist address the study objectives. Data analysis was guided by the research objectives. The data that was obtained from the questionnaire was edited, coded and analyzed for further use. Descriptive statistics was accustomed establish the practice of material possession policy within the pharmaceutical industry in Kenya. The study established that majority of the businesses representing exploits image/brand and know-how. The businesses also exploited both knowledge and business process. In another finding the study established that almost all of the businesses realized increased revenue arising from material possession protection. Secondly, the findings of the study show that there

is a powerful positive relationship between the material possession protection and innovation performance. The study further discovered that material possession protection influences innovation performance significantly. The study recommends the necessity for policy formulation on material possession protection by manufacturing companies within the pharmaceutical firms. The government of Kenya can use the findings of this research to induce pragmatic approach and can realize the advantages of material possession policy framework and its significant role within the pharmaceutical industry in Kenya.

Meetei Loitongbam (2019) examined the effects of globalization and innovation within the Indian Pharmaceutical Industry. Given the fact that the changing global environment brings about new opportunities and new markets for domestic firms in developing countries, this survey was necessary. The study surveyed the impacts of globalization and IPR protection on the innovation within the Indian pharmaceutical industry by use of the firm level panel data. This paper found that there's a positive and highly significant level of foreign ownership effect on R&D activities. This indicated that there's technology spillover within the Indian pharmaceutical industry. TRIPS implementation has insignificant effects on R&D innovation. It is also found that exporting firms and firms with a better productivity level are significantly more likely to hold out R&D activities. Hagedoorn and Wang (2012) focused on measuring innovation performance: is there a bonus in using multiple indicators? The innovation performance of companies has been studied quite extensively and for a protracted period of time. The results of the number of studies have not yet led to a generally accepted indicator of innovation performance and neither have they set typical indicators. To this point the variability in terms of constructs, measurements, samples, industries and countries has been substantial. This paper studies the innovation performance of an outsized international sample of nearly 1200 companies in four high-tech industries, employing a type of indicators. The said indicators ranged from R&D inputs, patent counts and patent citations to new product announcements as well as related pointers. The study established that a composite construct supported these four indicators clearly. In its conclusion it caught a latent variable 'innovation performance'. The findings also suggest that the statistical overlap between these indicators is that strong that future research may also think about employing any of those indicators to quicken the innovation performance of companies in high-tech industries. Moreira, Torkomian, & Soares (2016) did a study on exploration and firms' innovation performance-How does this relationship work? Majorly, the purpose of this paper was to research the

link between a firm's exploration strategy and its innovation performance, and whether its absorptive capacity (AC) moderates this relationship. The study adopted an econometric approach, using secondary data. The study synchronized two databases - Compustat and USPTO (United States Patent and Trademark Office), from which common data concerning 275 biopharmaceutical firms was extracted for the amount between 1990 and 2003. The study used negative binomial regression to research data. Findings indicated that the exploration strategy positively influenced firms' innovation performance. Nevertheless, an excessive amount of emphasis on this strategy can diminish its benefits for firms. Furthermore, a firm's absorptive capacity cannot positively moderate the curvilinear relationship between exploration and therefore the firm's innovation performance altogether contexts. This can be a contradiction the sooner theoretical predictions. This can be because of the existence of trade-offs between AC characteristics and other organizational factors. Crescenzi *et al.* (2013) on their part focused on innovation performance of firms in heterogeneous environments. That is mainly the connection between external knowledge and internal absorptive capacities. Their paper investigated the link between firm-level innovation performance and innovation prone external environments. This is where it is thought knowledgeable individuals tend to cluster. The study revealed that the organization's skillfulness and absorptive capacities, both potential and realized, make it possible for firms to leverage the supply of external knowledge and boost their innovation performance. The experimental research focused on England and relies on a novel arrangement of Community Innovation Survey (CIS) firm-level data and patent data. The end result showed that only firms complementing potential and realized absorptive capacities are ready to cash in on favorable external environments by actively combining internal and external sources of data.

D. Conceptual Framework

The conceptual framework for this study had the formal training practices as the independent variable and the dependent variable was firm innovation performance. The researcher explored variables such as seminars and conferences, specialization of employees, employee level of education and exchange programs. These are some of the components that formed the independent variable. The dependent variable comprised new products or services, innovation expenditures, market share, growth in revenues, quality of products level of reaction to demand and process innovativeness.

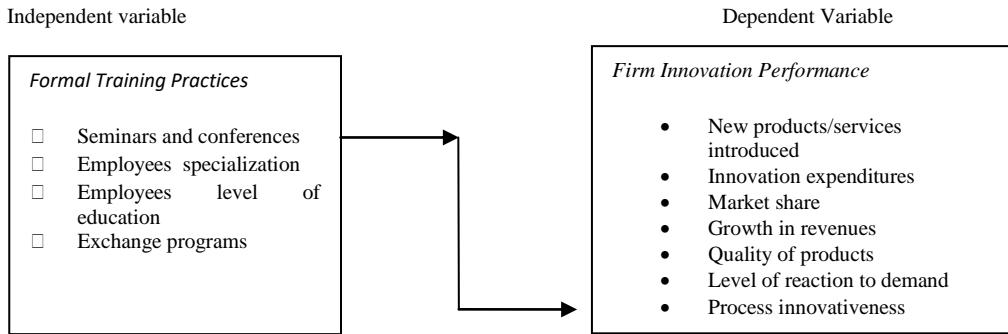


Figure 1. Conceptual Framework/Model

II. RESEARCH METHODOLOGY

A. Research Design

The research study adopted an ex post facto research design. Ex post facto research is suitable for conducting social research in cases where it is not possible or suitable to manipulate the characteristics of human participants. This design is thought to be a good substitute for true experimental research and may be used to test hypotheses about cause-and-effect or correlational associations.

B. Sampling Frame

Cooper & Schindler (2011) posit that a sampling frame is a list of elements from which a sample is actually drawn. This frame should be closely related to the population. In essence a sampling frame is the list or as it were, list of elements from which a probability sample is selected (Denscombe, 2014). A survey of 261 respondents constitutes this sample frame. This is necessary to include all the variables of the study for equal chances of selection. The respondents in the study are located mainly in the city of Nairobi. The study targeted a sample from each sector of manufacturers, distributors and retailers.

C. Target Population

A target population is simply the group of individuals that have been selected for study or for research. It can also be said to be a group with specific characteristics about whom the researcher wants to know more and from whom a sample is drawn. Banerjee & Chaudhury (2010), assert that a target population refers to a sample from the defined population from which the sample has been properly selected. In most case a researcher identifies the target population before research can commence. This is done by agreeing on certain aspects of the population. Therefore, a target population is the entire population, or group, that a researcher is interested in researching and analyzing. A sample frame is then selected from this target population. The target population for this study included all pharmaceutical firms in the city of Nairobi involved in manufacturing, marketing and dissemination of prescription medicines. The population of interest for study constituted selected pharmaceutical entrepreneurs operating within the city of Nairobi.

D. Data Collection Procedure

The research permit was sought from the National Council for Science and Technology after receiving the approval from the university. On receiving the permit, the researcher proceeded to the field to collect data from the respondents. The firms were visited and managers were consulted to provide suitable dates for the visits. The respondents from whom data was collected were asked to fill in the questionnaires. They handed over back the filled in questionnaires that ensured a high return rate. Sections A of the questionnaires were used to address demographic information and section B - E assessed the entrepreneurial knowledge diffusion practices. Data for this study was analyzed descriptively using regression analysis.

E. Table 1.0 Reliability of the Data

Reliability statistics for Formal training			
Reliability Statistics before factor analysis		Reliability Statistics after factor analysis	
Cronbach's	Number of items	Cronbach's Alpha	N of Items
0.7	4	0.7	4

The finding indicated that reliability statistics for formal training was 0.7 before and after factor analysis. Reliability statistics for documentation was before factor analysis and 0.722 after factor analysis. Reliability statistics for experiential learning was 0.664 before factor analysis and 0.786 after factor analysis. Reliability statistics for dissemination was 0.716 before factor analysis and 0.774 after factor analysis.

Table 2.0 Factor loading for formal training

Rotated Component Matrix ^a		
	Component	Remark
Seminars and conferences	.997	Retained
Employees specialization	.947	Retained
Employees level of education	.912	Retained
Exchange programs	.804	Retained
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.		
a. Rotation converged in 2 iterations.		

Factor loading from the factor analysis revealed that all items were retained. Seminars and conference responses (0.997), Employees specialization (0.947), employees level of education (0.912), Exchange programs (0.804)

III. RESULTS AND DISCUSSION

A. Effects of Formal Training on Innovation Performance of Pharmaceutical Firms

Table 3.0: Formal Training on Innovation Performance of Pharmaceutical Firms

Statements		SD	D	U	A	SA	Total	Mean	Std Dev
The level of education of an employee determines how productive they are in pharmaceutical firms	F	8	13	24	64	42	150	3.80	1.047
	%	5	8.6	15.8	42.4	28.2	100	76.0	
Employees who have specialized are most productive in pharmaceutical firms.	F	8	16	22	59	45	150	3.79	1.074
	%	5	10.8	14.4	39.6	30.2	100	75.8	
Employees who have participated in exchange program have been seen to be innovative	F	0	3	21	93	33	150	4.04	0.342
	%	0	2.2	13.7	61.9	22.2	100	80.8	
Seminars and conferences are the most influential ways of enhancing employee performance	F	8	12	26	42	63	150	3.93	0.346
	%	5	7.9	17.3	28.1	41.7	100	78.6	

The study findings revealed that 76.0% (mean=3.80) were of the view that the level of education of an employee determines how productive they are in pharmaceutical firms, 75.8% (mean=3.79) were of the view that employees who have specialized are most productive in pharmaceutical firms., 80.8% (mean=4.04) were of the view that employees who have participated in exchange program have been seen to be innovative, 78.6% (mean=3.93) were of the view that seminars and conferences are the most influential ways of enhancing employee performance.

This implies that that pharmaceutical manufacturing firm needs employees who are experts at what they do. Through personal expertise knowledge sharing is made easier through direct involvement or observation. Interview responses indicated that pharmaceutical firm requires information analysis of drugs as a form of dissemination on the performance can be interpreted to mean that it's a very important area of research in the manufacturing sector. It aids in the following research areas, drug formulations, impurities/degradation of products and biological samples containing drugs and their metabolites.

Interview schedule responses noted that the pharmaceutical manufacturing sector is a science field which requires not just diverse knowledge but also special skills to apply.

One responded noted that Specialization can be in fields related to preparation of drugs, drugs resistances, and safe drug composition among other areas that will make the employee be uniquely qualified.

Another Responded noted that not any learned person without special skills can work in the pharmaceutical sector and hence

The study sought to determine the effect of formal training on performance of pharmaceutical firms and the study findings are presented in table 3.0

B. Formal Training on Innovation Performance of Pharmaceutical Firms

the findings show specialization of employee to be crucial in enhancing the performance of the pharmaceutical firm

The study finding disagreed with Lennick (2012) in his study on task specialization which showed that specialized employees can only do one task hence can affect the production of the firm. Job specialization tends towards a case where individuals are meant to perform only one task. For instance, they are not trained to handle multiple areas in the workplace. This has a consequence in that when a critical skill is absent the process will suffer. Moreover, employees in job specialization may not possess a wide range of applicable skills and therefore this makes it hard for them to adapt new function or needs of the organization. Unemployment is likely to occur as firms can easily shut down a factory or an assembly line owing to the fact that many of the laid-off workers usually have a hard time of adjusting to new occupation.

C. Regression Analysis

The study performed ANOVA and regression analysis to estimate the relationships between the study variables. The study results were as tabulated in table 4.0 and table 4.1

D. ANOVA Model

Table 4.0: ANOVA Model

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
1	.936 ^a	0.877	0.868	0.0868	99.676	0.000 ^b

The ANOVA model indicated the simple correlation was 0.936 which indicates a degree of correlation. The total variation in innovation performance of pharmaceutical firms was 87.7% explained by organizational design (R Square=0.877).

The study results further revealed that the ANOVA model predicted innovation performance of pharmaceutical firms significantly well (p=0.000^b). This indicated the statistical significance of the regression model that was run and that overall the regression model statistically significantly predicted the innovation performance of pharmaceutical firms (i.e., it was a good fit for the data).

Table 4.1 Regression on Innovation Performance of Pharmaceutical Firms

Coefficients a						
Model		Unstandardized Coefficients	Std. Error	Standardized Coefficients	T	Sig.
1	(Constant)	0.043	0.351		0.123	0.902
	Formal training	0.238	0.078	0.1150	3.059	0.003

The explicit form of equation (1) above is represented as follows:

$$Y = \beta_0 + \beta_1 X_1 + \dots + \epsilon \dots\dots\dots (1)$$

Where:

$$Y = \beta_0 + \beta_1 X_1 + \dots + \epsilon$$

β_0 = Constant of the model

β_i = Coefficients of the independent variables

ϵ =error term controlling for unit-specific residual in the model

X_1 = Formal Training

This regression equation generated for the study was as follows below.

$$Y \text{ (Innovation performance of pharmaceutical firms)} = 0.043 \text{ (Constant)} + 0.238 \text{ (formal training)} + 0.351 \text{ (Std. Error)}$$

The equation is therefore, $Y = 0.043 + 0.238X_1 + 0.351 \epsilon$

IV. CONCLUSIONS

The study tried to assess the influence of formal training practices offered to employees offered in pharmaceuticals firms on their innovation performance. The results of the study attained through open and close ended questionnaires and structured interviews designed with the aim of gathering opinions individuals were distributed to 163 and 150 responded. The study concluded that the variable; formal

training was found to be significant in innovation performance of pharmaceutical firms in Kenya. One of the recommendations is that further studies could be carried out on a formal training to enhance knowledge-driven culture within which innovations can be incubated and shared to enhance innovation and creative thinking.

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