"ENHANCING AND NURTURING CREATIVITY AND INNOVATION IN NAIROBI GIS FIRMS"

BY

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STUDENT'S DECLARATION

I, the undersigned, declare that this is my original work and has not been submitted to any other college, institution or university other than the United States International University in Nairobi for academic credit.

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This project has been presented for examination with my approval as the appointed supervisor.

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Deputy Vice Chancellor, Academic Affairs
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ABSTRACT

The purpose of the study was to discuss the factors that enhance and nurture creativity and innovation in Nairobi Geographic Information Systems firms. The research questions were: Does the Education System affect creativity and innovation? Does the organisational environment affect the level of innovation? and What are the effects of Intellectual Property legislation on creativity and innovation?

The research design applied was descriptive in nature. The population under study was individual working in GIS Firms based in Nairobi, Kenya. A sample of 65 was drawn from the population. Stratified random sampling was applied and questionnaires were administered to collect primary data. A questionnaire was best suited for this study as it encouraged a high response rate since it promoted anonymity, was standardized and provided respondents time to answer without interferences. The questions provided were both open and close ended.

The data collected was analysed using the Statistical Package for Social Science (SPSS) software. Descriptive statistics were used to analyse the nominal and ordinal data including frequencies and percentages. These were presented using frequency tables and figures.

The findings of this study showed that there is a great impact of the education system of a nation on the level of creativity and innovation of a country. The results showed that there is need for reforms of the Kenya Education System in order to enhance the practical knowledge of the curriculum and shifting examination focus to understanding concepts rather than memory ability of the theories.

The organisation environment also has a major role in enhancing and nurturing creativity and innovation. In particular, the findings showed that the corporate level management largely contributed to encouraging and nurturing creativity and innovation as this impact on the supervisors, provision of sufficient resources, development of a learning culture and promotion of freedom to suggest and initiate new ideas without discriminating and intimidating the staff.

The findings of the study also show that protection of Intellectual Property rights help to protect the creative works of innovators, prevents significant risks to consumers of...
counterfeit products and benefits the society by adding value and providing a guarantee of quality. The findings also show the need for public education on the importance of intellectual property as well as enforcing the laws that protect them.

There is a great impact of the education system of a nation on the level of creativity and innovation of a country. Promotion of quality of the learning experience, use of ICT in the learning process, encouraging cognitive and creative thinking and administering exams that test on understanding rather than memory ability are minimal yet a necessity in the Kenyan education system. The government must take up this responsibility. The work environment also impacts on the creativity and innovation of the staff. It is the responsibility of the corporate level management to encourage creativity, provide the resources required, develop a learning culture as well as promote the freedom to suggest and initiate new ideas without discrimination. The intellectual property laws help to protect the works of innovators, add value and promote quality of products in the society.

The researcher recommends that the government urgently embarks on reforms in the Kenyan education system in order to enhance the quality of the learning experience, promote the use of ICT in the learning process, encourage cognitive and creative thinking and administer exams that test on understanding rather than memory ability. The researcher also recommends that those in corporate level and middle level management bear the responsibility of nurturing a culture that promotes freedom to initiate and suggest new ideas, provision of sufficient resources and actively encourage creativity and innovation. There is also need for public education on the importance of protecting intellectual property rights as well as enforcement of the related laws. This is the responsibility of the legislators and other regulatory bodies. In conclusion, the researcher recommends further study on the impact of these three factors on creativity and innovation in other business industries in Kenya.
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LIST OF ABBREVIATIONS

GIS  Geographic Information Systems

ICT  Information Communication Technology

IP   Intellectual Property
CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Problem

The concept of sustainable competitive advantage has lately been questioned and it has been suggested that there is a need to shift from a previous, static view of competitive advantage to a more dynamic one. This fundamental change is reflected in the emergent dynamic capabilities framework which complements the well-established resource-based view and explains how companies can renew and transform their resource bases in such a manner that these fit with a changing environment over time. More specifically, dynamic capabilities have been suggested to consist of the capacities to sense and shape opportunities and threats, seize opportunities and maintain competitiveness by enhancing, combining, protecting and reconfiguring firms’ intangible and tangible assets (Teece, 2007).

A sustainable competitive advantage is the prolonged benefit of implementing some unique value-creating strategy not simultaneously being implemented by any current or potential competitors, along with the inability to duplicate the benefits of this strategy. Creativity is necessary to produce a unique value-added strategy (Hoffman, 2000).

Networks that drive today’s global economy are the domains of the creative mind and new forms of innovation and communication which are influencing every sector. Innovation and creativity can no longer be treated as separate entities. Leveraging creativity across the enterprise and the economy requires applied creativity at all points in the business process, from the point of initial inspiration to the delivery of successful products and services. It also requires a correspondingly sympathetic regime throughout the education sector, providing industry with a pipeline of creative achievers who can get the job done (McCabe, 2001). It is clear that a networked economy where standards are prevalent is the only way for small companies to survive. In such a world, creativity and innovation provide the only competitive advantage (Routti, 2001).
The inescapable conclusion I have reached by studying a large number of companies in many parts of the world is that the truly excellent are those who have consciously learned how to harness creative ideas from within the firm and from the external environment and at the same time managed the firm’s innovation in a systematic way (Knox, 1990).

As global competition intensifies, it's more important than ever that companies figure out how to innovate if they are going to maintain their edge, or maintain their existence at all. On every level—from the individual to the company to the economy as a whole—creativity is something that can be created and fostered if you have the right guidance and incentives (Blanding, 2011).

Creativity is defined as the tendency to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others (Franken, 2006). It is also defined as the act of turning new and imaginative ideas into reality. Creativity involves two processes: thinking, then producing. Innovation is the production or implementation of an idea. If you have ideas, but don't act on them, you are imaginative but not creative (Naiman, 2010).

Creativity definitely has a particular definition as put to it by a dictionary but the total and precise essence of the word cannot be absolutely captured in a definition. It goes way beyond a few strings of words, summed up for short; it's a phenomenon. Creativity often times means working against the tide called normal; and it naturally drives the subject to live outside the norm, making him or her refuse to go with the flow. Creative people always have an issue coming to terms with the extra flow of mental energy they tend to feel just before they can learn to control and deploy the energy rightly to achieve potential. Most times, it almost drives them over the brink as they really cannot explain it; the world cannot rationalize their actions and would very often treat them like outcasts until they have mastered their art and can come up with something tangible enough to justify them before their world. Creativity takes following your instincts and swimming against the tide. It is never an easy one, especially as it means going against the traffic of the majority, but it takes one who can survive the onslaught to come out victorious ultimately earning the right to be referred to as creative (Odunukan, 2012).
Creativity is the mental and social process—fuelled by conscious or unconscious insight—of generating ideas, concepts, and associations. Innovation is the successful exploitation of new ideas: it is a profitable outcome of the creative process, which involves generating and applying in a specific context products, services, procedures, and processes that are desirable and viable. Naturally, people who create and people who innovate can have different attributes and perspectives (Serrat, 2009).

In a research commissioned by General Electric and conducted by independent research and consulting firm StrategyOne, the findings from 3,000 senior business executives in 22 countries sought to determine how businesses define innovation. Most of them (35%) defined innovation as the implementation of new processes, products, organisational changes or marketing changes. 73% of executive's agree innovation is driven more by creativity than scientific research (General Electric Company, 2012).

So what makes innovators different from the rest of us? Most of us believe this question has been answered. It's a genetic endowment. Some people are right brained, which allows them to be more intuitive and divergent thinkers. Either you have it or you don't. But does research really support this idea? Creativity skills are not simply genetic traits endowed at birth, but that they can be developed (Dyer, Gergersen, and Christensen, 2011).

Nairobi is the Capital City of Kenya, one of the largest business hubs of Eastern Africa. It is a multi-cultural city with more than 40 ethnic communities as well as vast numbers of foreigners. Over the years, many foreigners have set up their businesses there due to the various numerous business opportunities that are available. According the 2009 Census, Nairobi had a population of 3,138,369 (Kenya National Bureau of Statistics, 2010). It hosts most of the major business ventures in the country more so those affiliated to information technology. The Geographic Information Systems (GIS) sector in Nairobi has grown steadily and substantially from the year 2000. More and more firms have embraced geographic information systems technology in conducting their business processes. Major GIS firms such as Esri and NAVTEQ have also put their footprints in Nairobi. Other organisations such as iHub have come up to encourage innovation and creativity in software application technology in Nairobi especially targeting those individuals in their tertiary and secondary education.
1.2 Statement of the Problem

Creativity and innovation have been characterized as the secret ingredient in most of the successful firms in various industries. However, creativity and innovation in Africa has been minimal in comparison to the Western countries. This can be attributed to various factors such as the education system. This study sought to establish various aspects of an education system that are key in developing and encouraging creativity among the students in turn improving the economy of a country.

In her study on sources of innovation and creativity, Karlyn Adams recommended that the United States of America education curricula be designed to promote the three components of successful intelligence which are focus on the synthetic, analytical and practical aspects (Adams, 2005). This study sought to contribute to the knowledge on development of an effective education system in Kenya and how to use it to leverage the country technologically and economically.

The organisation environment has also been characterized as a major contributor to the level of creativity and innovation in various firms. This study analysed various aspects that promote creativity and innovation in organisations. This was in view of the major impact that organisations have in enhancing and nurturing creativity and innovation.

By setting clear, achievable goals, allowing autonomy in achieving those goals, and removing distractions or unnecessary time pressures, managers can help free up employees' creative impulses and guide them down the path of real innovations that can help the company. This was the conclusion made by Teresa on her study on “The Power of Small Wins” (Amabile and S, 2011).

Intellectual Property rights were established with an aim of protecting the creative works of various innovators. However, others have seen this as a means of enriching a few individuals at the expense of many. This study sought to determine the effects of Intellectual Property laws on enhancing ad nurturing creativity and innovation.

A major persuasion against classical Intellectual Property Rights (IPR) regimes is that they are based on Western paradigm of property ownership and are therefore alien and impractical in cultural historical and institutional context of most developing countries - more particularly to the traditional and indigenous communities within the developing
countries. Based on the needs assessment by Bilateral Trade Agreement in 2002, most countries in Eastern and Southern Africa are willing to take the road that leads to an effective sui generis system with intent to integrate protection of their traditional knowledge and associated innovations in agriculture, environment and health. Furthermore, to address outstanding equity issues relating to access, utilization and sharing of benefits arising from exploitation of traditional knowledge and local genetic resources. There are many international agreements such as Trade-Related Aspects of Intellectual Property Rights (TRIPS), World Intellectual Property Organization (WIPO), Inter-governmental Committee on Intellectual Property and Genetic resources (IGC), International Treaty on Plant Genetic Resources Food and Agriculture (IT-PGRFA) and others. However, there is lack of policy coherence in translating the agreements at National levels. The challenge here is to match the agreements to local national issues such as national food security, poverty alleviation, economic development, biodiversity and health (African Technology Policy Studies Network, 2012).

1.3 Purpose of the Study
The purpose of this study was to establish the factors that affect creativity and innovation in Nairobi GIS Firms as well as proposed ways to enhance and nurture it.

1.4 Research Questions
1.4.1 Does the Education System affect creativity and innovation?

1.4.2 Does the organisation environment affect the level of innovation?

1.4.3 What are the effects of Intellectual Property legislation on creativity and innovation?

1.5 Importance of the Study
1.5.1 Businesses
This study will benefit employers as it will highlight measures to be taken to promote, enhance and nurture creativity and innovation in the work place. This will serve to be most beneficial to the shareholders as the company will achieve competitive advantage and increase the shareholder wealth.
1.5.2 **Government**

The Government of Kenya will also benefit from this study through the suggested changes to be made in the Education Sector. This in turn will enhance the quality of education of the country.

1.5.3 **Academics and Researchers**

This study will be of use to academics and researchers as it will contribute to the body of knowledge on enhancing and nurturing creativity and innovation as well as provide opportunities for further research.

1.5.4 **Students**

This study will be beneficial to students in their personal reading on enhancing and nurturing creativity in the lines of study and resultant professions.

1.6 **Scope of the Study**

The study was carried out in Nairobi, the capital city of Kenya. It was conducted among staff of various GIS firms which operate in Nairobi and took place from April to June 2012.

Some of the limitations experienced during the research included uncooperative respondents who provided incorrect or incomplete information. Also, the study only covered Nairobi GIS firms and therefore did not apply directly to other parts of the country.

1.7 **Definition of Terms**

1.7.1 **Geographic Information System (GIS)**

A Geographic Information System (GIS) is a process for the input, storage, retrieval, analysis, and output of geographic information (Calkins and Tomlinson, 1977).

A geographic information system (GIS) integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information. GIS allows us to view, understand, question, interpret, and visualize data in many ways that reveal relationships, patterns, and trends in the form of maps, globes, reports, and charts. A GIS helps you answer questions and solve problems by looking at...
your data in a way that is quickly understood and easily shared. GIS technology can be integrated into any enterprise information system framework (Esri Corporation, 2012).

1.7.2 Sustainable Competitive Advantage
A firm experiences competitive advantages when its actions in an industry or market create economic value and when few competing firms are engaging in similar actions (Barney, 2002). Sustainable competitive advantage is the unique position that an organization develops in relation to competitors that allows it to outperform them consistently (Hofer and Schendel, 1978).

1.7.3 Creativity
It's the ability to generate and implement new ideas that result in improved efficiency and effectiveness of a given system. These ideas are new and useful in solving existing problems or satisfying existing needs (K'aol, 2011).

1.7.4 Innovation
It's the introduction of new methods and products. It's also the commercialization or bringing inventions to use through engineering, organizing and marketing (K'aol, 2011). It's also the successful implementation of creative ideas within an organization. In this view, creativity by individuals and teams is a starting point for innovation; the first is necessary but not sufficient condition for the second (Amabile, Conti, Coon, Lazenby and Herron, 1996).

1.7.5 Culture
These are the shared patterns of behaviors and interactions, cognitive constructs, and affective understanding that are learned through a process of socialization. These shared patterns identify the members of a culture group while also distinguishing those of another group (Centre for Advanced Research on Language Acquisition, 2011). Culture is the collective programming of the human mind that distinguishes the members of one human group from those of another (Hofstede, 1984).

1.8 Chapter Summary
In this chapter, the background of the study discussed the concept of sustainable competitive advantage and its importance in leading to prolonged business benefits from the strategies implemented. The background of the study also sought to define creativity
and innovation and how they contribute to sustainable competitive advantage. The purpose of this study was to establish the factors that affect creativity and innovation in Nairobi GIS firms and propose ways to enhance and nurture it. This study was important as it sought to determine the effects of the Education system, infringement of copyrights, and organisation culture on creativity and innovation. It also sought to propose measures to be adopted to enhance and nurture creativity and innovation. The study focused on GIS firms located in Nairobi, the Capital City of Kenya. The literature review of the factors affecting creativity and innovation was carried out in Chapter 2. The research methodology to be applied was discussed in Chapter 3 while the results and findings were highlighted in Chapter 4. In Chapter 5, the results were discussed, conclusions made and recommendations as well.
CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction
In this chapter various literature sources were reviewed based on the three research questions. Question one sought to determine the effects of the education system on creativity and innovation while question two sought to establish whether the organisational environment affects the level of innovation. Question three analysed the effects of legislation on creativity and innovation. At the end, a chapter summary was provided.

2.2 Impact of Education System on Creativity and Innovation
The length of time students spend in formal education has increased over the years. While a high school diploma used to be sufficient qualification to get a job, today, a four year undergraduate degree is often required. Some students are finding it necessary to attend graduate school or even post-graduate. Formal education has also expanded to encompass the other end of the continuum with preschools opening up to very young ages. With this increase in preparation, one would think that today’s students would be more prepared than the previous generation. Instead students are lacking necessary skills after graduation. Critical thinking is a necessary component for innovation to succeed. People can have the most creative ideas but in reality, they may be impossible to implement. It is also difficult for freshmen and sophomores to take advantage of internships, co-ops, or civic engagement programs as it is assumed that they are thought to be inexperienced. Understandably, companies do not want someone who is fresh out of high school to be interning at their business. Yet it is vital to enable the students, early on in the curriculum, to start building the foundation of creativity that will lead to innovation (Bloom and Krathwohl, 1956).

2.2.1 Pitfalls of Traditional Education Systems
According to Bloom’s Taxonomy, there are six skills in the cognitive domain: knowledge, comprehension, application, analysis, synthesis, and evaluation. Knowledge can be facts, terms, or details—generally speaking basic concepts. Comprehension is the understanding of facts by interpretation and visible demonstration. Application is making use of the newly acquired knowledge to apply to more general situations. Analysis is the
ability to dissect the acquired knowledge and break it apart to understand the cause or objective. Synthesis is the ability to create something new upon previous knowledge and experiences. It is this skill that people most often term with creative ability. Finally, evaluation, the highest level of Bloom’s Taxonomy, is when people can make independent decisions beyond what others have expressed or imparted. Unfortunately, most educational systems focus on the basic skills knowledge, comprehension, and sometimes application. It is much easier to provide a test on memorization of facts than it is to promote synthesis and evaluation of projects with no clear-cut answers (Bloom and Krathwohl, 1956).

The education system is generally seen as having a major impact on the creativeness of individuals and on the creative climate. Education is assumed to develop people’s skills and abilities, for all types and levels of education. This concerns all levels and fields of education, although there is an explicit emphasis on creativity in artistic and cultural fields. Education in arts in particular is assumed to have a positive impact on the creativity of people. The quality of the educational system is believed to be positively linked to creativity, by meeting the needs of a competitive economy. Moreover, educated consumers are more likely to be comfortable with new ideas, demand sophisticated and novel products and services, and consider different options (Hollanders and Cruysen, 2009). The ability of the educational system to develop and nurture creativity and innovation among learners is a cornerstone of an educational system that contributes to the development of a knowledge economy in Jordan. To do this, the educational system must itself be capable of nurturing an environment that encourages individuals to think in creative ways, innovate to solve problems, and capture what is learned and apply this within the wider system (Kozma, 2008).

It is argued that the creative dimension in the national curriculum has been purged by various government directives since the Ruskin speech in 1976, all aiming to introduce provisions of standardization, centralization, and vocationalisation of education. The plethora of centralized testing regimes and quality assurance measures has not only damaged the esteem of teachers and pupils, but has also turned education into a game where teachers teach the art of passing exams, and pupils realize the academic dangers of nonconformity (Maisuria, 2005).
A research conducted established that the provision of standardization and rigid control of the curriculum was having an adverse effect on pupils' creativity in schools. This research exposed the climate of high anxiety among pupils, who were aware that the measurement of their success depended on reaching the prescribed standards of the national curriculum. This meant that pupils were reluctant to indulge in creativity, and preferred to comply with the expectations specified by the framework. The study discovered that the inflexible and highly structured teaching methods advocated by the standardized curriculum had not only affected students, but teachers also felt less autonomous and their role as teacher had been devalued to the role of facilitator of the national curriculum. The ramifications of this were that a liberal, progressive child-centered approach to learning could not be adopted, and tailoring teaching strategies to maximize learning was restricted because of pressures from the quality inspectorates. The study found that the requirement to reach national targets and maintain reputations in league tables meant that teaching methods lacked flair and reflexivity, because teachers wanted to stay within the box, and keep the pupils there too (Davis, 2000).

2.2.2 Need for Education Reforms

In recent years Ireland has committed to significant educational reform in technological education. This new focus encourages students to become enterprising, creative and empowered during their learning experience. Technology Education is recognized as a fundamental discipline within the Irish Education System. The strength of Technology Education and the quality of the students graduating from courses of study in the third level institutes in the country is often seen as one of the main reasons for Ireland's previous economic success (Seery, Canty and Dunbar, 2010). The growth of the global economy has added urgency to calls to upgrade education and training as prime sources of national economic competitiveness. The Singaporean government can be said to have taken these calls seriously. The Ministry of Trade and Industry's Economic Committee recommended the education of each individual to his or her maximum potential and the development of creativity and flexible skills to maintain Singapore's international competitiveness in the global economy (Tan and Gopinathan, 2000).

ICT can play a particularly important role in supporting education reform and transformation (Means, Roschelle, Penuel, Sabelli and Haertel, 2004). ICT-related pedagogical changes treat the students as active agents who are engaged in collaborative
projects that solve complex, real world-like problems or in sustained investigations and interactions that generate new ideas by building on and extending the ideas of others (Scaradmalia and Bereiter, 2006). The kind of education reforms that have been associated with the introduction of ICT include curriculum reforms that emphasize high levels of understanding of key concepts within subject areas and the ability to apply these concepts to solve complex, real-world problems (Bransford, Brown and Cocking, 2000). Other curriculum reforms emphasize what are sometimes called “21st century skills”, qualities that prepare students for the knowledge economy, such as creativity, information management, communication, collaboration, and the ability to direct one’s own work and learning (Resnick and Wirt, 1996). Some countries advocate the use of ICT to improve the management efficiencies or accountability of schools or the education system, more generally. Consequently, these policies emphasize computer-based testing and the use of digital data and management systems (Kozma, 2008).

It is clear that our education system is no longer concerned with the type of vocational training approach that traditionally predominated technology education in this country. The critical aims of these new syllabi display how the focus of technology education has changed, and now focusing on endorsing a cohort of students to be equipped with skills of design and realization and the ability to apply these skills by thinking and acting imaginatively and creatively. Through the technology subject area it is recognized that students are presented with a learning environment that is not as rigid as other areas of the curriculum. Therefore educational outcomes of creativity, autonomy, fulfillment etc. are essential elements of a broad and balanced curriculum (Seery, Canty and Dunbar, 2010).

Thinking Schools, Learning Nation, was launched by the Singaporean prime minister in June 1997. It focuses on developing all students into active learners with critical thinking skills and on developing a creative and critical thinking culture within schools. Its key strategies include the explicit teaching of critical and creative thinking skills; the reduction of subject content; the revision of assessment modes; and a greater emphasis on processes instead of on outcomes when appraising schools. The second initiative, the Masterplan for Information Technology in Education, was also launched in 1997. It is an ambitious attempt to incorporate information technology in teaching and learning in all schools. The third and most recent major initiative focuses on university admission criteria. The Committee on University Admission System recommended in its 1999 report.
Sternberg promotes a “triarchic theory” asserting that there are three main aspects of intelligence that are key for creativity. One of these is synthetic referring to the ability to generate ideas that are novel, high quality and task appropriate. A part of this is the ability to redefine problems effectively and to think insightfully. The second aspect is analytical thinking which refers to the ability to judge the value of one’s own ideas, to evaluate their strengths and weaknesses and suggest ways to improve them. The third aspect is practical referring to the ability to apply intellectual skills in everyday contexts and to “sell” creative ideas (Sternberg and O’Hara, 1999). In his article, “Creativity in the Classroom” Sternberg expresses the importance of these three types of thinking to overall intellectual functioning and successful intelligence. The analytic and practical are separate from and support the synthetic. Studies indicate that when students were taught in ways that emphasised all these three abilities, they significantly outperformed students taught in a way that only emphasised analytical abilities. The holistic approach also increased performance on strictly analytical, memory-related questions (Sternberg, 2003).

2.3 Impact of the Organisational Environment on Creativity and Innovation

Creativity, namely, the ability to produce novel work, is considered to be both the starting point and the root of innovation (Amabile, Conti, Coon, Lazenby and Herron, 1996); (Shalley and Perry-Smith, 2001). Previous studies on creativity development have mainly focused on individual factors, including intelligence (Sternberg and O’Hara, 1999), personality (Helson, 1996), cognition (Runco, 1986), and methods of improving individual creativity (Amabile, 1982). In addition to personal qualities, many studies have attempted to identify work environments and social climates that may foster or impede innovation in a working setting (Shalley, Zhou and Oldham, 2006); (Wongtada and Rice, 2008). This section will focus on the impact of the working environment on creativity.

2.3.1 Elements of Organisational Creativity Culture

Signaling a commitment to innovation is a critical first step in the innovation process. The development of a sustainable culture that expects and encourages innovation at every level and function of the organization actually undergirds each element of the innovation framework. Culture is both the starting place and the underlying base for the entire innovation process. Creating an innovation-friendly culture means moving steadily toward comprehensive changes that make the organization a different place (Kasper, 2008).
Studies on work-related environmental features have been brought together under the general heading of “climate” which has also been defined as a set of shared views regarding individuals’ perceptions of organizational policies, practices and procedures (Patterson, Warr and West, 2004). Climate is also defined as the observed and recurring patterns of behavior, attitudes and feelings that characterize life in an organization (Ekvall, 1991). To be specific, organizational climate is a property of the organization itself and represents employees’ descriptions of an area of strategic focus or organizational functioning (Parker, Huff, Altmann, Lacost and Roberts, 2003). The past two decades have seen growing research interest in studying creativity climate or the climate for innovation.

The ‘creative climate’ is a term coined by Ekvall in defining how an organization’s culture manifests itself in the creative output from its employees (Ekvall, 1997). Ten factors are listed which collectively describe the creative climate of the organization. These factors are: challenge, freedom, idea support, trust/openness, dynamism/liveliness, playfulness/humour, debates, conflicts, risk taking and idea time. With the exception of conflicts’, each factor is viewed as having a positive impact on creative output. Independently, Amabile has developed the componential theory of organizational creativity. This model recognizes that organizational creativity can be considered from the perspectives of the individual, the team and also the wider work environment (Amabile, 1997). The model comprises three key elements which can be used as an instrument of assessing organizational creativity climate: resources, management practices and organizational motivation. Each of these elements interacts with one another and has an impact on the resulting level of innovation. Based on this model, Amabile identified two major organizational contextual dimensions as essential to creativity climate, namely, environmental stimulants and obstacles. The stimulants are hypothesized to encourage organizational creativity and consist of six factors, namely organizational encouragement, supervisory encouragement, work group supports, freedom, sufficient resources, and work challenge. Two factors, named “organizational impediments” and “workload pressure,” are considered to hinder creativity (Amabile, 1988).

We found that the stimulants of creativity climate had stronger relationships with employee innovation than did the obstacles. The results clearly indicate the importance of the five stimulant factors: organizational encouragement, supervisory encouragement,
work group support, sufficient resources and challenging work. However, one stimulant (freedom) and two obstacles (organizational impediments and workload pressure) failed to show significant influences on perceived innovation. The finding enriches this field of study by unveiling how component construct of organizational creativity works in a non-Western culture (Yeh-Yun Lin and Liu, 2012).

Although climate perception originates from individuals, organizational members are typically exposed to the same work environment and other proximal influence. These perspectives regard creativity climate as employees' shared perceptions about the structure and practices occurring in organizations. Once a work unit establishes a distinct character, it may result in greater homogeneity among unit members' attitudes and values and how they perceive the organization; the same rule expands to the whole organization (Seibert, Silver and Randolph, 2004). Climate for creativity promotes the generation, consideration, and use of new products, services and ways of working, as creativity climate supports the development, assimilation, and utilization of new and different approaches and concepts (Isaksen, Lauer and Ekvall, 1999).

In addition, the organizational level of creativity climate covers both the social environment and work environment that influence the work carried out in organizations (Amabile et al, 1996). The main purpose of an organizational climate study is to identify the variables which result in an organization's ability to mobilize its workforce in order to achieve business goals and enhance performance (Baer and Frese, 2003).

A study to understand factors which enable teams to succeed in producing creative results (Richards and Moger, 2000) led to the revision of the popular Tuckman and Jensen model for group development (Tuckman and Jensen, 1977). The research produced a list of seven factors that promote creativity: platform of understanding, shared vision, climate, resilience, idea owners, network activators and learning from experience. These further support the factors described by both Amabile and Ekvall. Creative leadership is another topic addressed by contemporary literature. The propulsion model of creative leadership defines three different kinds of leadership: leadership which accepts existing ways of doing things, leadership which challenges existing ways of doing things, and leadership which utilizes existing ways of doing things in new and unique ways (Sternberg, Kaufman and Pretz, 2004).
The importance of communication and collaboration to the creative process and its resultant outcomes is discussed by Sonnenburg as having four dimensions of a theoretical framework. The first is the type of communication referring to the medium which members of a team use to communicate example is face to face, phone/ videoconference or email/fax. The second is course of performance which relates to the actual process of producing innovative outcomes or products. The recommendation here is ‘to refresh the communication process, to use learning aids and creative techniques’. The third framework is the working style which is the way in which participants contributions come into the communication process and a creative working style is exemplified by open communication. The fourth, problem nature and implication of solution relates to the level of autonomy needed to allow the team to reach a satisfactory solution (Sonnenburg, 2004).

There is a lack of knowledge and understanding of the role of creativity in the creative industries. Indeed, much of the work on organizational creativity has emerged from studies investigating firms in other sectors. Firms in the creative industries are also unique, as they often provide creative services to other organizations (Banks, Calvey, Owen and Russell, 2002). Thus, there is an expectation that on a daily basis, individuals will face new problems and creative challenges. Routine is the exception rather than the norm. This differs from firms where daily activities are routine, and thus specific capabilities are needed for non-routine work that requires a creative leap (Napier and Nilsson, 2006).

In 2009, a study was conducted to investigate whether the characteristics of organizational creativity varied in different sectors of the creative industries. From the data collected it was found that there were similarities in the results from branding and product development from whom the majority of the results were acquired. However, there was also evidence of distinct differences between the sectors which related to the nature of their work such as project structure and outputs. These findings (the relative importance of the various factors; the applicability of the competing models; and sectoral differences) result in a contribution to existing theory. They suggest that the basic models of organizational creativity may not necessarily be generalizable and that a more contingent approach would be beneficial. In different sectors, it is likely that different factors will be more important (Moultrie and Young, 2009).
Creating an innovative culture is totally intertwined with creating a learning culture. For some organizations, the language about “learning organizations” has already grown tiresome. And yet, innovation is fundamentally about effective learning. Intentional learning processes help to identify the full potential of deliberately developed innovation or to discover the value of an accidental idea. Without a learning culture that is constantly looking for patterns in activities, refining and improving activities, and sifting for the meaning of things, organizations frequently end up losing or warehousing their best information and knowledge. Systematizing innovation requires more attention to the learning culture, i.e., a work environment that promotes collaborative inquiry, experimentation, tolerance for risk, and an acceptance of and commitment to learning from setbacks or failures. Understanding the creation of learning cultures that go beyond mere information systems will be as important to understanding innovation as direct research on innovation itself (W. K. Kellogg Foundation, 2008).

2.3.2 Relationship between Creativity Climate and Performance

Some studies have supported a direct link between creativity climate and performance (Baer and Frese, 2003). Although a positive relationship between climate and performance was well received, inconsistent research results persist. An investigation of research excellence in 14 universities found that climate was not a predictor of research performance and questioned whether climate perception and description are a consequence rather than a cause of organizational performance (West, Smith, Feng and Lawthom, 1998). Another study also failed to identify a significant relationship between empowerment climate and individual job performance (Seibert, Silver and Randolph, 2004). The inconsistency may possibly result from the mediating effect of various variables such as perceived justice, perceived organizational support, commitment, job involvement, job satisfaction, and motivation (Patterson, Warr and West, 2004). In fact, many studies indicate that creative behavior is influenced by employee motivation (Griffin and Neal, 2000); (Shalley and Gilson, 2004). Among these variables, motivation in particular is seen as a crucial mediator of the relationship between climate and performance. Several authors have argued that context influences creativity and organizational productivity via employee motivation (Amabile, Conti, Coon, Lazenby and Herron, 1996); (Patterson, Warr and West, 2004).
The cognitive state of work motivation mediated the relationship between climate and outcomes (Kopelman, Brief, and Guzzo, 1990). Few works have empirically tested its mediating effect on the aforementioned relationship (Carr, Schmidt, Ford and De Shon, 2003); (Shalley and Gilson, 2004).

Even more than particular cognitive abilities, a set of motivational attributes like childlike curiosity, intrinsic interest, and perseverance bordering on obsession seem to set individuals who change the culture apart from the rest of humankind (Nakamura and Csikszentmihalyi, 2002). We have found so much evidence in favour of intrinsic motivation that we articulated what we call the Intrinsic Motivation Principle of Creativity. People will be most creative when they feel motivated primarily by the interest, satisfaction, and challenge of the work itself and not by external pressures i.e. extrinsic motivation. Amabile's maze analogy states that the extrinsically motivated person will take the shortest time, most obvious path to get the reward at the finish line. The intrinsically motivated person will explore various pathways and alternatives, taking his/her time and enjoying the process along the way. This exploration will lead to novel, alternative solutions, some of which will turn out to be more appropriate and successful than the original, obvious path (Amabile, 1992).

Given the condition of keener global competition, innovation has become a buzzword. Yet, the value of innovation goes beyond the conceptual level. It has to be effectively perceived and implemented to generate real values. Therefore, understanding how organizational innovation is perceived by employees helps managers identify required improvement and management practices for maximizing organizational performance. Another added value of this research is the findings that freedom, organizational internal strife, conservatism, and workload pressure do not show expected effects on perceived innovation, very likely because of cultural difference. It is always fascinating to see how a western theory applies to the eastern world; this opens an ample avenue for researchers to explore in this increasingly globalized economy (Yeh-Yun Lin and Liu, 2012).

2.4 Effects of Intellectual Property Legislation on Creativity and Innovation

2.4.1 Benefits of Protection of Intellectual Property

Intellectual property is unique, as it is the fruit of personal creation and inventiveness. It might be a poem that you write, the name your hairdresser thinks up to sell his or her
services, or a mother’s invention for a non-spill cup for babies. It can also be a Picasso painting, an Akira Kurosawa film, a Naguib Mahfouz novel, a new method of irrigation for farmers in arid regions, the invention of the light bulb, a computer chip or a jet turbine engine. In virtually every instance, intellectual property stimulates progress, transforming society and adding value to our lives (International Chamber of Commerce, 2005).

Creative products are the cornerstones of the agencies and valuable for competing with the other agencies to gain a share in the market and also participating to fundamental contests to strengthen the reputation of the agency. Besides, creative work needs an ability to create something valuable and different. Therefore public and non-public instruments are vital to protect this creative effort (Ozlem and Karahasan, 2006).

One purpose of the intellectual property rights system is to provide incentives to innovators to produce new inventions and creations. This in turn provides society with a steady stream of innovations that fuel economic, cultural and social progress, help to alleviate poverty and disease, and enrich our cultural heritage. Intellectual property rights enable people to benefit from their innovations and creative work, and to prevent others from copying or unfairly gaining from the inventor’s creativity and investment. By according these rights, society provides an incentive for people and organizations to invest time, resources and original thinking to develop innovative products and technologies and expand knowledge and culture. This encourages the production of a wide range of quality goods and services, and helps maintain fair competition (International Chamber of Commerce, 2005).

The World Economic Forum Global Competitiveness Report indicates a correlation between the protection of intellectual property rights and national competitiveness. In 2004, the 20 countries that were perceived as having the most stringent intellectual property protection were classed among the top 27 in the WEF’s growth competitiveness index. Conversely, the 20 countries perceived as having the weakest intellectual property regimes were ranked among the bottom 36 for growth and competitiveness (World Economic Forum, 2005).

The intellectual property system was an important catalyst for the development of indigenous technology by Korean companies, several of which have become global market leaders. Korea’s spectacular transformation from a poor farming economy in the
services, or a mother’s invention for a non-spill cup for babies. It can also be a Picasso painting, an Akira Kurosawa film, a Naguib Mahfouz novel, a new method of irrigation for farmers in arid regions, the invention of the light bulb, a computer chip or a jet turbine engine. In virtually every instance, intellectual property stimulates progress, transforming society and adding value to our lives (International Chamber of Commerce, 2005).

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1960s with a per capita income of less than US $100 to a highly industrialized country with a per capita income of US $12,000 today, resulted from a systematic economic and trade development policy that included incentives for technological innovation and the development of domestic intellectual property assets (Kim, 2004).

Intellectual property benefits society, and in particular consumers, by adding value and providing a guarantee of quality. Trademarks and geographical indications allow consumers to differentiate between goods and services from different producers and to select products by manufacturers whose reputations they trust. They also represent a lasting link between the producer and its product and encourage producers to maintain responsibility for the safety, efficacy and quality of the product even after it has been sold (International Chamber of Commerce, 2005).

Many small and medium sized enterprises (SMEs), in both developed and developing countries rely heavily on intellectual property rights. Design rights, copyrights, patents and trademarks are essential for numerous industries composed mainly of SMEs such as the textile, toy, publishing, biotechnology, and retail industries, to name just a few. In developing countries, intellectual property rights have spurred the development of huge industries (e.g. the software and film industry in India) as well as allowed small businesses to develop innovative business models (e.g. the franchising of fast food stands). In 2003, 80% of international applications for trademarks came from applicants with two or fewer trademarks, indicating a high use of the system by smaller companies (World Intellectual Property Organization, 2003).

Almost all of the more than 500 SMEs and independent inventors who replied to a 2005 survey by the Confederation of Swedish Enterprises said that intellectual property rights were important for SMEs. Their responses pointed out that large companies have other competitive advantages (such as size, market position or financial strength), while a patent can be the only advantage of a small company (International Chamber of Commerce, 2005).

The correlation between innovation performance and economic development has strengthened over the past 15 years. Technological progress is now responsible for up to one half of the growth of the US economy and, in 2000 intangible assets represented 70 percent of corporate assets in the United States. Creative industries, such as publishing,
music, film, software and arts, are a powerful generator of economic growth and employment in both the developed and developing world. These industries — heavily reliant on copyright — contributed more than 1.2 trillion Euros to the EU’s economy, produced added value of 450 billion Euros, equaling 5.3% of the EU’s GDP, and employed 5.2 million persons in 2000 (Turku School of Economics and Business Administration, 2003).

Society provides legal rights over intellectual property to encourage the production of inventions and creative works that benefit society and to help innovators and creators make a living from their work. These rights, which can belong to individuals or organizations, are recognized by governments and courts. The system is designed to benefit society as a whole, in both developed and developing countries, striking a delicate balance to ensure that the needs of both the creator and the user are satisfied. This balance is maintained through checks within the intellectual property system itself and in the larger regulatory framework, to ensure that the system is sustainable and beneficial to all stakeholders. Intellectual property law limits what can be protected and for how long. Intellectual property rights do not protect ideas. They protect only expressions of ideas, in the case of copyrights, and inventions fulfilling certain strict and well-established criteria in the case of patents. These limitations and conditions are built-in mechanisms to balance the rights of intellectual property owners with the interests of society (International Chamber of Commerce, 2005).

The primary objective of the intellectual property laws is not to reward the author or inventor, but rather to secure for the public the benefits derived from the labors of authors and inventors. The argument that a particular interest group will make more money and therefore be more creative does not satisfy the constitutional requirement of the intellectual property clause (Kastenmeier and Remington, 1985).

Throughout the world, intellectual property rights have been justified under at least three theories. Under a “natural rights” theory, copyright protection merely codifies a creator’s natural right to possess the fruits of his or her labor. Under a “just reward” theory, copyright protection recognizes that justice dictates that creators deserve the benefits of what they have created. Under a “public welfare” theory, however, copyright protection is
granted solely as a necessity to promote the creation and distribution of new creative works, a result that would be in the public’s best interest (Nadel, 2004).

Intellectual property rights allow innovators and creators to choose the terms on which they distribute their work. They can choose, for example, to license and sell their works or inventions, to make them available for free, or to allow their use subject to certain conditions. Looking forward, as economies develop, the use and value of intellectual capital will gradually replace the value of raw materials as a percentage of capital input toward economic growth. As such, intellectual property is an increasingly important asset that must be continually nurtured, protected and stimulated to grow (International Chamber of Commerce, 2005).

To capture the source of the innovative activities, special emphasis is given to creative ideas and human capital. Moreover intellectual property rights are introduced as the sole stimulus for innovation. The underlined significance of protection of inventor is associated with the public good property of knowledge and creative ideas. Non-rival and non-excludable good property discusses that, under perfect competition and absence of protection of intellectual property rights, there will not be enough motivation for inventors to create. Actually it is the patent and other kinds of intellectual property rights (copyrights, trademarks etc.) that cause the transformation of the non-excludable and non-rival good of invention, thus knowledge, into a non-rival but partially excludable one (Centi and Rubio, 2005).

One of the main sectors that creativity and intellectual property rights gain importance for innovation and growth is advertising industry. Advertising sector covers the advertisers, the advertising agencies, the media agencies, the advertising mediums and the producers that take part in the production of advertisements (Ozlem and Karahasan, 2006). Today, in Turkey, there are approximately 100 advertising agencies in the organized manner with customer relations, creative and media departments. The number of total employees in the advertising agencies is projected approximately 3000. Real size of the sector is estimated to be around 2,534 million USD and 3,675 million New Turkish Liras for 2006. In recent years, audit has been started to be implemented by state institutions. Two main public audit institutions are: Advertising Board of the Ministry of Industry and Trade, Radio and Television Supreme Committee. As a non-public institution, The Advertising Self-
Regulatory Board (RÖK) was established in 1994 by the advertising agencies as a mission of maintaining ethics in the advertising works in the line with International Code of Advertising Practice (Turkish Association of Advertising Agencies, 2006).

The overbroad copyright protection allows the most popular creations to earn revenues well beyond what publishers need to cover the production and distribution costs of their new creations: successes and failures. Publishers then feel compelled to turn around and dissipate these revenues on larger marketing campaigns or greater rents for the few most popular creators (Ku, 2002). In fact, this type of rent seeking may well dissipate 100% or more of the increased revenues. The higher marketing expenses raise entry barriers, leaving many economically borderline projects unprofitable (Kahneman and Tversky, 1979).

Fashion designs are not unprotected merely because they fall into a legal limbo between intellectual property schemes, however. Both policymakers and courts have been guided by compelling policy reasons to limit design protection. They have expressed concerns that, while such protection might benefit certain designers, it could create monopolies in the fashion industry that would stifle the creativity of future designers, hinder competition and drive up prices for consumer goods. Designers could demand payment for design elements that currently are free, and this cost would be borne by others in the industry and by the public. The less affluent would not be able to afford the range of fashions they currently enjoy. Therefore, policy advisors have been unconvinced that "new protection will provide substantial benefits to the general public which outweigh removing such designs from free public use." As one judge put it," Congress and the Supreme Court have answered in favor of commerce and the masses rather than the artists, designers and the well-to-do." As this paper has described, intellectual property has been expanding rapidly in recent years, driven by the argument that more protection will spur greater creativity and save creative industries from extinction. But what if this isn't true? What if these expansions might actually harm the very creativity and industries they seek to protect (Cox and Jenkins, 2005)?

Our perspective on patents and copyright is a similar one: from a social point of view, and in the view of the founding fathers, the purpose of patents and copyrights is not to enrich the few at the expense of the many but only to promote innovation and creativity. From a
theoretical point of view, intellectual monopoly may both increase and decrease innovation: it provides more revenues to those that innovate, but also makes innovation more costly. For centuries, the cause of economic progress has been identified with that of free trade. In the decades to come, sustaining economic progress will depend, more and more, upon our ability to progressively reduce and eventually eliminate intellectual monopoly. As in the battle for free trade, the first step must consist in destroying the intellectual foundations of the obscurantist position. Back then the mercantilist fallacy taught that, to become wealthy, a country must regulate trade and strive for trade surpluses. Today, the same fallacy teaches that without intellectual property laws, monopoly innovations would be impossible and that our governments should prohibit parallel import and enforce draconian intellectual monopoly rules (Boldrin and Levine, 2011).

2.4.2 Threats of Infringement of Intellectual Property Laws
Every industry sector is affected, including airplane and car parts, food, batteries, medicines, film, music, publishing and toys. Collectively, the wider economic, social and developmental costs create a massive drain on national economies, especially those struggling to develop. Piracy and counterfeiting are responsible for a widespread loss of lawful employment opportunities and a massive loss of tax revenues for governments. They rob innovators and creators of reward for effort and innovation, undermine local culture by reducing the incentive to invest, and ultimately limit the diversity and availability of high-quality goods and services. Consumers are increasingly being harmed by unsafe counterfeit products that can present significant health and safety risks. In addition, there is evidence of increasing links between piracy and counterfeiting operations and organized crime (International Chamber of Commerce, 2005).

The World Health Organization (WHO) estimates that counterfeit drugs account for 10% of all pharmaceuticals, and up to 60% of drugs in developing countries. According to WHO, 16% of counterfeit drugs contain the wrong ingredients, 17% contain incorrect amounts of the proper ingredients and 60% have no active ingredients whatsoever (US News and World Report, 2001).

Intellectual property theft has a huge economic cost in both developed and developing countries. Local and imported products alike suffer considerably from counterfeiting and
piracy. Intellectual property theft stifles innovation and deters honest local entrepreneurs from investing in product and market development. This particularly affects knowledge-based industries, the keystone of the economic strategies of many countries. Countries that aim to increase the value of their exports by using their intellectual capital are also hampered in their efforts by counterfeiting and piracy. In India, fast-moving consumer goods lose approximately 15% of market share to counterfeits and 38% of auto parts are fake. Approximately 22% of Japanese corporate executives state that counterfeits are their biggest concern in trade negotiations with China. The US and other developed countries are not immune. The California economy loses some US $34.5 billion per year to counterfeiting and piracy, while UK industry reports it lost nearly £10 billion in 2002 (International Chamber of Commerce, 2005). Tax and excise losses caused by counterfeiting and piracy are considerable. A recent study estimated the average loss of tax revenue in the EU to be 7.581 million Euros in the clothing and footwear sector, 3.017 million Euros in the perfumes and cosmetics sector, 3.731 million Euros in the toys and sports articles sector, and 1.554 million Euros in the pharmaceuticals sector (Blakeney, 2010).

Intellectual property, properly managed, can be a powerful tool for growth and progress. To fulfill its potential, intellectual property protection has to be supported by appropriate policies and a deep commitment by governments to establish an effective infrastructure to process and make use of intellectual property rights. Suggested measures include: providing for clear and enforceable intellectual property rights ownership, establishing an active and coherent intellectual property policy coordinated throughout government bodies; educating local communities, businesses and the public on the potential benefits of the intellectual property system (International Chamber of Commerce, 2005).

2.5 Chapter Summary

In this chapter, literature from various authors was reviewed to provide various viewpoints and expound further on the research questions. These literature sources were also compared to the findings at the end of the research. The next chapter proposed the research methodology to be applied during the research.
CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

In this chapter, the proposed research methodology is discussed in detail in view of the
research questions. The research design is expounded, as well as the population and
sampling design, data collection methods, research procedures and data analysis methods.
At the end a chapter summary is be provided.

3.2 Research Design

The research design used in this study was the Descriptive Research Design. Descriptive
research is conducted to describe phenomena as they exist. It is used to identify and
obtain information on the characteristics of a particular problem or issue. Descriptive
research goes further in examining a problem than exploratory research, as it is
undertaken to ascertain and describe the characteristics of the pertinent issues (Collis and
Hussey, 2009). This design was most suited because the study sought to establish and
analyse the relationship between the level of creativity and innovation and the Education
System, Organisation Environment and Intellectual Property Legislation. A cross-
sectional study was conducted through surveys. The independent variables were the
Education System, Organisation Environment and Intellectual Property Legislation while
the dependent variable was innovation and creativity.

3.3 Population and Sampling Design

3.3.1 Population

A research population is generally a large collection of individuals or objects that is the
main focus of a scientific query. A research population is also known as a well-defined
collection of individuals or objects known to have similar characteristics. All individuals
or objects within a certain population usually have a common, binding characteristic or
trait (Experiment-Resources, 2010). The population of this study consisted of individuals
who work in GIS firms.
Table 3.1: Population Distribution

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIS Application Development</td>
<td>36</td>
<td>13</td>
</tr>
<tr>
<td>GIS Projects &amp; Training Firms</td>
<td>248</td>
<td>87</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>284</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Human Resource Managers

3.3.2 Sampling Design

3.3.2.1 Sampling Frame

The sampling frame is a list of all elements in the population of interest. The sampling frame operationally defines the target population from which the sample is drawn and to which the sample data will be generalized (Herek, 2000). The sampling frame for this study was the list of number of employees per department as provided by the Human Resource Managers of GIS firms in Nairobi.

3.3.2.2 Sampling Techniques

The sampling technique was Stratified Random selection where the population was subdivided into individuals who work in firms that deal with GIS Application Development and GIS Projects & Training. Each element had a known and equal probability of being the sample selected.

3.3.2.3 Sample Size

Usually, the population is too large for the researcher to attempt to survey all of its members. A small, but carefully chosen sample can be used to represent the population. The sample reflects the characteristics of the population from which it is drawn (Statpac, 2011).

The sample size was determined using the following formula:

\[ n = \frac{z^2 \times pq}{e} \]

Description:
3.4 Data Collection Methods

In this study primary data was collected using a questionnaire prepared by the researcher. The questionnaire was divided into sections which sought to obtain information regarding the specific research questions. A questionnaire was best suited for this study as it encouraged a high response rate since it promoted anonymity, standardization and provided respondents time to answer without interferences. The questions provided were a mixture of both open to close ended, however the later constituted the majority. Closed ended questions helped in guiding the responses as well as in data analysis while the open ended questions helped to get suggestions from the respondents concerning information not captured. The sample questionnaire is provided in the appendices.

3.5 Research Procedures

The researcher prepared the questionnaire with regard to the research objectives. The questionnaire was pre-tested on a small number of respondents to identify the likely problems and eliminated them. The sample respondents should be similar to the target respondents of the survey (Management Study Guide, 2011). The respondent’s supervisor also served as a good source of quality control for the questionnaire.

The well formatted questionnaire was be prepared using simple English and focused on the core issues in order to reduce the length in turn encouraging a higher response rate. An introductory cover letter was also provided and anonymity was observed to increase the response rate.
3.6 Data Analysis Methods

Quantitative methods of data analysis can be of great value to the researcher who is attempting to draw meaningful results from a large body of qualitative data. The main beneficial aspect is that it provides the means to separate out the large number of confounding factors that often obscure the main qualitative findings. They also allow the reporting of summary results in numerical terms to be given with a specified degree of confidence (Abeyasekera, 2003).

The data collected through the questionnaires was prepared for analysis by first editing for legibility and ensuring consistency. Data cleaning was then undertaken where the respondents' patterns of responses to other questions were used to impute a suitable value to missing responses. However, where the missing information was substantial, pair-wise or case-wise deletion was applied. Thereafter, coding of responses to the close ended questions was done.

On completion of data preparation, the qualitative data was analyzed using descriptive statistics. Frequencies highlighted the number of observations for the different classifications while cross tabulations showed the relationships between different variables. The analyzed data was presented using tables and figures. The data analysis tool that was mainly used was the Statistical Package for Social Science (SPSS) software.

3.7 Chapter Summary

This chapter highlighted the research methodology applied in the study. These include the research design, population and sampling design, data collection methods, research procedures and data analysis methods. The population consisted of individual working in GIS firms located in Nairobi. Questionnaires were the main source of data collection and analysis was mainly done through qualitative statistical methods. The results were presented using tables and figures.

The next chapter concentrated on analysis of research findings and presentation of the results based on the research objectives.
CHAPTER FOUR

4.0 RESULTS AND FINDINGS

4.1 Introduction

This chapter presents the results and findings of the researcher based on the responses to the questionnaires distributed to the participants. The total number of questionnaires that were sent out was 108. The response rate from the survey was 60% as a total of 65 responses were received. The findings have been analyzed on the basis of the research questions and the specific objectives set out in the first chapter of this report. The findings have been presented using charts, tables, and frequency tables depending on the issue being reported.

4.2 Demographics of Respondents

Figure 4.1 indicates that 72 percent of all respondents were male while 28 percent were female. According to Figure 4.2, 15 percent of all respondents were below 25 years, 51 percent between 25 and 29, 22 percent between 30 and 34 while those above 35 years were the minority i.e. 12 percent. This shows that the industry is highly constituted of males such that the ratio is nearly three men to one woman. Also, 88 percent of all respondents were below 34 years old since the GIS technology is fairly new in Kenya.

Figure 4.1: Gender

Figure 4.2: Age
4.3 Impact of Education System on Creativity and Innovation

The respondents were asked various questions which aimed to obtain more information about the impact of the education system on creativity and innovation.

4.3.1 Education System of Respondents

The respondents were asked to indicate the education system that they went through. The findings are shown in Table 4.1 below. It can be seen that respondents went through three main education systems. 3 percent went through 7-4-2-3 education system, 94 percent went through 8-4-4 education system while 3 percent went through GCSE education system. It is clear that majority of the participants went through the 8-4-4 education system.

Table 4.1 Education System Undertaken

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency (f)</td>
</tr>
<tr>
<td>a) 7-4-2-3</td>
<td>2</td>
</tr>
<tr>
<td>b) 8-4-4</td>
<td>61</td>
</tr>
<tr>
<td>c) GCSE</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
</tr>
</tbody>
</table>

4.3.2 Opinions on Education System Undertaken

The respondents were asked to indicate their opinions concerning various factors of the education system that they went through. Cross tabulations were done to show the relationship between the type of education system and the various factors.

4.3.2.1 Encouragement of Creative Thinking

Figure 4.3 below indicates that majority of the respondents agreed that creative thinking was encouraged in the education system they underwent. 9 percent strongly agreed and 42 percent agreed that creative thinking was encouraged while 15 percent disagreed, 29 percent were neutral, and 5 percent strongly disagreed.
4.3.2.2 Quality of Education System

The respondents were asked to indicate their opinion concerning the quality of the education system they underwent. Table 4.2 below illustrates the cross tabulation of the quality of three education systems. This depicted that those who undertook 7-4-2-3 and GCSE systems of education fully agreed that quality of teaching was present. On the other hand, 29 out of 61 respondents who undertook the 8-4-4 system agreed that quality was applied, 2 out of 61 strongly agreed, while 18 out of 61 were neutral and 10 out of 61 disagreed.

Table 4.2: Quality of Services in Education System

<table>
<thead>
<tr>
<th>Quality services were offered</th>
<th>Agree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Which system of education did you go through?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) 7-4-2-3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>b) 8-4-4</td>
<td>29</td>
<td>10</td>
<td>18</td>
<td>2</td>
<td>2</td>
<td>61</td>
</tr>
<tr>
<td>c) GCSE</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td>10</td>
<td>18</td>
<td>2</td>
<td>2</td>
<td>65</td>
</tr>
</tbody>
</table>
4.3.2.3 Application of ICT in Teaching

The respondents were asked whether ICT was applied in the teaching techniques of the education system that they underwent. Figure 4.4 shows that 37 percent of all respondents disagreed that ICT was applied in the education system which they underwent, 12 percent strongly disagreed while 18 percent agreed.

![ICT Application in Teaching](image)

**Figure 4.4: ICT Application in Teaching**

4.3.2.4 Preparation for Career

The respondents were asked whether the curriculum in the education system they underwent equipped them for their careers. Figure 4.5 below shows that 12 percent of all respondents strongly agreed that the curriculum of the education system which they underwent equipped them for their career, 42 percent agreed, 32 percent remained neutral, while 8 percent disagreed and 6 percent strongly disagreed.
4.3.2.5 Exams Tested on Memory Ability

The respondents were asked whether the exams administered tested on memory ability in the education system they underwent. Figure 4.6 indicates that 35 percent of all respondents strongly agreed that the exams administered tested on memory ability, 46 percent agreed, 14 percent remained neutral while only 5 percent disagreed. Therefore, 81 percent of all respondents felt that exams administered tested on ability to recall the concepts taught.
4.3.2.6 Need for Education Reforms in Kenya

The respondents were asked whether they saw need for education reforms in Kenya. Figure 4.7 shows 95 percent of all respondents believed that there's need for education reforms in Kenya.

![Need for Education Reforms in Kenya](image)

Figure 4.7: Need for Education Reforms in Kenya

The respondents who found need for education reforms were further asked which main problem they would address. Majority suggested that the curriculum and exams need to be re-analyzed to enhance practical skills which help solve real world problems and impact the society. Other suggestions were on application of ICT in learning, encouragement of critical and creative thinking and improving on the quality of teaching techniques.

4.3.2.6 Motivation for Higher Education Level

The respondents were asked what education level they had completed and what motivated them to desire a higher education level. Figure 4.8 below indicates that 66 percent of all respondents had obtained an undergraduate degree and 26 percent had a postgraduate degree. The desire to develop individual skills ranked as the main motivation for seeking a higher education level, represented by 77 percent in Figure below 4.9. This was followed by desire for academic qualification at 9 percent, employment promotion at 8 percent and salary raise at 5 percent.
4.4 Impact of Organisation Environment on Creativity and Innovation

The respondents were asked various questions which aimed to obtain more information about the impact of the organisation environment on creativity and innovation. Different questions were posed to gain more information on various factors of the organisation environment.
4.4.1 Opinions on Organisation Environment

4.4.1.1 Corporate Level and Supervisor Encouragement of Creativity

The respondents were asked whether there was corporate level and supervisor encouragement towards creativity in their organisation environment. Table 4.3 illustrates the cross tabulation of the corporate level versus the supervisor level encouragement towards creativity. The table shows that there’s a correlation between corporate level and supervisor encouragement towards creativity. 16 out of the 65 respondents strongly agreed that there was corporate level encouragement towards creativity of which 11 of the 16 also strongly agreed that their supervisors encouraged them to be creative. 31 out of the 65 respondents agreed that there was corporate level encouragement towards creativity of which 24 of the 31 also agreed that their supervisors encouraged them to be creative.

Table 4.3: Corporate Level versus Supervisor Encouragement of Creativity

<table>
<thead>
<tr>
<th>My supervisor encourages me to be creative</th>
<th>Agree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>There’s corporate (managerial) level encouragemen</td>
<td>Agree</td>
<td>24</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>11</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>2</td>
<td>15</td>
<td>15</td>
<td>1</td>
<td>65</td>
</tr>
</tbody>
</table>

4.4.1.2 Sufficiency of Resources to Facilitate Creativity and Innovation

The respondents were asked whether there was provision of sufficient resources to encourage creativity in their organisational environment. Table 4.4 highlights the cross tabulation of the corporate level encouragement towards creativity in comparison to the sufficiency of resources. The table shows that there’s a correlation between corporate level encouragement towards creativity and provision of sufficient resources to facilitate this. 16 out of the 65 respondents strongly agreed that there was corporate level
encouragement towards creativity of which 9 of the 16 also strongly agreed that they were provided with sufficient resources to facilitate creativity. 31 out of the 65 respondents agreed that there was corporate level encouragement towards creativity of which 21 of the 31 also agreed that they were provided with sufficient resources to facilitate creativity.

**Table 4.4: Corporate Level Creativity Encouragement versus Resources Sufficiency**

<table>
<thead>
<tr>
<th>Sufficient resources are available to facilitate creativity and innovation</th>
<th>Agree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>There's corporate (managerial) level encouragement towards creativity</td>
<td>Agree</td>
<td>21</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree</td>
<td>6</td>
<td>0</td>
<td>1</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>7</td>
<td>10</td>
<td>13</td>
<td>3</td>
<td>65</td>
</tr>
</tbody>
</table>

**4.4.1.3 Freedom to Suggest and Initiate New Ideas**

The respondents were asked whether there was freedom to suggest and initiate new ideas in their organisational environment. Table 4.5 below highlights the cross tabulation of the corporate level encouragement towards creativity in comparison to the freedom to suggest and initiate new ideas. The table shows that there's a correlation between corporate level encouragement towards creativity and freedom to suggest and initiate new ideas. 16 out of the 65 respondents strongly agreed that there was corporate level encouragement towards creativity of which 10 of the 16 also strongly agreed that there was freedom to suggest and initiate new ideas. 31 out of the 65 respondents agreed that there was corporate level encouragement towards creativity of which 22 of the 31 also agreed that there was freedom to suggest and initiate new ideas.
Table 4.5: Freedom to Suggest and Initiate New Ideas

<table>
<thead>
<tr>
<th>There’s freedom to suggest and initiate new ideas</th>
<th>Agree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>There’s corporate level encouragement towards creativity</td>
<td>Agree</td>
<td>22</td>
<td>0</td>
<td>7</td>
<td>2</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>6</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>2</td>
<td>16</td>
<td>12</td>
<td>1</td>
<td>65</td>
</tr>
</tbody>
</table>

4.4.1.4 Effect of Creativity on Performance

The respondents were asked whether there their level of creativity affected their performance. Table 4.6 below shows the cross tabulation of the corporate level encouragement towards creativity in comparison to the impact of creativity on individual performance. The table shows that there’s a correlation between corporate level encouragement towards creativity and impact of creativity on individual performance. 16 out of the 65 respondents strongly agreed that there was corporate level encouragement towards creativity of which 12 of the 16 also strongly agreed that their creativity affected their performance. 31 out of the 65 respondents agreed that there was corporate level encouragement towards creativity of which 21 of the 31 also agreed that that their creativity affected their performance. Thus, corporate level encouragement towards creativity results in improved staff performance.
Table 4.6: Effect of Creativity on Performance

<table>
<thead>
<tr>
<th>There’s corporate (managerial) level encouragement towards creativity</th>
<th>Does your level of creativity affect your performance?</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a) Yes</td>
<td>b) No</td>
</tr>
<tr>
<td>Agree</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>Disagree</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Neutral</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>16</td>
</tr>
</tbody>
</table>

4.4.1.5 Presence of a Proactive Learning Culture

The respondents were asked whether there was a proactive learning culture in the organisation culture. Table 4.7 below shows the cross tabulation of the corporate level encouragement towards creativity in comparison to presence of a learning culture. The table shows that there’s a correlation between corporate level encouragement towards creativity and presence of a proactive learning culture. 16 out of the 65 respondents strongly agreed that there was corporate level encouragement towards creativity of which 10 of the 16 also strongly agreed that a proactive learning culture was present in their organisation environment. 31 out of the 65 respondents agreed that there was corporate level encouragement towards creativity of which 19 of the 31 also agreed that a proactive learning culture was present in their organisation environment.

Table 4.7: Presence of a Proactive Learning Culture on Creativity

<table>
<thead>
<tr>
<th>There’s corporate level encouragement towards creativity</th>
<th>A proactive learning culture is present</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agree</td>
<td>Disagree</td>
</tr>
<tr>
<td>Agree</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Neutral</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>7</td>
</tr>
</tbody>
</table>
The respondents were also asked what they consider to be the most important factor in developing a creative and innovative organisation culture. Majority suggested the need to promote freedom to express, share and try out new ideas without intimidation from supervisors and managers as the most important factor. Other suggestions were on encouraging a learning culture, teamwork, offering training, aligning staff to the area of work where they are most talented, and provision of sufficient resources.

4.5 Impact of Intellectual Property Legislation on Creativity and Innovation

The respondents were asked various questions to obtain more information concerning the impact of the intellectual property legislation on creativity and innovation.

4.5.1 Opinions on Intellectual Property Legislation

4.5.1.1 IP Legislation Benefits to Society

The respondents were asked whether IP benefits society by adding value and providing a guarantee of quality. Table 4.8 shows the cross tabulation of the benefits of IP to society in comparison to the lack of IP protection creating a massive drain on national economies. The table shows that there's a correlation between the IP benefiting society by adding value and providing a guarantee of quality and lack of IP protection creating a massive drain on national economies. 38 out of the 65 respondents agreed that IP benefits society by adding value and providing a guarantee of quality of which 23 of the 38 also agreed that lack of IP protection creates a massive drain on national economies. 19 out of the 65 respondents strongly agreed that IP benefits society by adding value and providing a guarantee of quality of which 12 of the 19 also strongly agreed that lack of IP protection creates a massive drain on national economies.
Table 4.8: Benefits of IP versus lack of IP protection

<table>
<thead>
<tr>
<th>IP benefits society by adding value and providing a guarantee of quality</th>
<th>Agree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Strongly Agree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>23</td>
<td>2</td>
<td>8</td>
<td>5</td>
<td>38</td>
</tr>
<tr>
<td>Disagree</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Neutral</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>4</td>
<td>0</td>
<td>3</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31</strong></td>
<td><strong>3</strong></td>
<td><strong>14</strong></td>
<td><strong>17</strong></td>
<td><strong>65</strong></td>
</tr>
</tbody>
</table>

4.5.1.2 IP Laws Protection of Creative Works

The researcher embarked to find out whether IP laws protect the creative works of innovators. Figure 4.10 below highlights that 31 percent of all respondents strongly agreed IP laws protect the creative works of innovators, 40 percent agreed, 26 percent remained neutral while only 3 percent disagreed. Thus, 71 percent of all respondents believed that IP laws help to protect the creative works of innovators.

4.5.1.3 Purpose of IP is to Enrich Few at Expense of Many

The respondents were asked whether the purpose of IP was to enrich a few individuals at the expense of many others. Figure 4.11 below shows that 12 percent of all respondents strongly disagreed that the purpose of IP is to enrich few at the expense of many, 45 percent disagreed, 17 percent remained neutral while 17 percent agreed. Thus, 57 percent
of all respondents did not believe that the purpose of IP is to enrich a few individuals at
the expense of many.

<table>
<thead>
<tr>
<th>Purpose of IP is to Enrich Few</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
</tr>
<tr>
<td>17</td>
</tr>
</tbody>
</table>

Figure 4.11: Purpose of IP is to Enrich Few

4.5.1.4 High Cost of Original Works Contribute to Desire for Pirated Products

The respondents were asked whether the high cost of original works contribute to the desire
for pirated products. Figure 4.12 below shows that 26 percent of all respondents strongly
agreed the high cost of original works contribute to the desire for pirated products, 51 percent
agreed, 8 percent remained neutral while only 15 percent disagreed. Thus, 77 percent of
all respondents believed that the high cost of original works contribute to the desire for pirated
products.

<table>
<thead>
<tr>
<th>High Cost of Original Works Contribute to Desire for Pirated Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
</tr>
<tr>
<td>51</td>
</tr>
</tbody>
</table>

Figure 4.12: High Cost of Original Works Contribute to Desire for Pirated Products
4.5.1.5 **Presence of Public Education Concerning Potential Benefits of IP**

The respondents were asked whether there was public education concerning the potential benefits of IP. Figure 4.13 below shows that 15 percent of all respondents strongly disagreed there was public education concerning the potential benefits of IP, 37 percent disagreed, 20 percent remained neutral, 23 percent agreed while only 5 percent strongly agreed. Therefore, 52 percent of all respondents believed that there was lack of public education concerning the potential benefits of Intellectual Property laws in Kenya. This forms the majority.

![Presence of Public Education on Potential IP Benefits](image)

**Figure 4.13: Presence of Public Education on Potential Benefits of IP**

### 4.5.2 **IP Rights as an Incentive to Innovators**

The researcher sought to find out whether IP rights and laws acted as an incentive to innovators. Figure 4.14 indicates that 92 percent of the total respondents agreed that IP laws do act as incentive to innovators.
4.5.3 Correlation of Protection of IP Rights and National Competitiveness

The respondents were asked whether there exists a correlation between protection of IP rights and national competitiveness. Figure 4.15 indicates that 78 percent of all the respondents agreed that there exists a correlation between protection of IP rights and national competitiveness.

4.5.4 Respect for IP Rights in Kenya

The respondents were asked whether they believed IP rights and laws were respected or infringed in Kenya. Figure 4.16 indicates that 85 percent of the total respondents believed that IP rights were not respected in Kenya while 15 percent believed they were respected.
4.6 Chapter Summary

In this chapter, the results and findings of the data collected was analysed and displayed. The first section discussed the demographics of the respondents. Thereafter data collected concerning the impact of the education system, organisational environment and intellectual property legislation on creativity and innovation was analysed and presented. In the next chapter, the discussion, conclusion and recommendations of the study will be provided.
CHAPTER FIVE

5.0 DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction
This chapter provides the researcher’s discussion of the finding of the study gathered during the data collection and portrayed in the preceding chapter. The discussions are done in relation to the research questions. Conclusions are drawn from the findings and recommendations are also provided.

5.2 Summary
The purpose of the study was to establish the factors that enhance and nurture creativity and innovation in Nairobi GIS firms. The study sought to answer three main research questions: Does the Education System affect creativity and innovation? Does the organisation environment affect the level of innovation? What are the effects of Intellectual Property legislation on creativity and innovation?

The research adopted a descriptive research design which sought to establish and analyse the relationship between the level of creativity and innovation and the Education System, Organisation Environment and Intellectual Property Legislation. A cross-sectional study was conducted through a survey where questionnaires were administered. The population of this study consisted of individuals who work in 14 GIS firms.

Stratified Random technique was used as the sampling technique where the population was subdivided into individuals who are in firms that deal with GIS Projects & Training and GIS Application Development. A sample of 65 respondents was selected. The findings were analyzed using the descriptive statistical technique and later presented using tables, charts and frequency tables. The Statistical Package for Social Science (SPSS) tool was using in the data analysis.

The findings on the impact of the education system on creativity and innovation revealed that majority of the respondents had gone through the 8-4-4 system of education. Majority of the respondents concurred that creative thinking was encouraged and quality services were offered. However, ICT was not applied in the teaching techniques and exams were more focused on memory ability than practical aspects of the subject at hand. Most of the respondents had already attained a graduate degree and desired to acquire a post graduate
degree with the main aim of developing their skills. Also, majority believed that there was need for education reforms.

The research findings concerning the impact of organisation environment on creativity and innovation indicated that there was a correlation between corporate level encouragement towards creativity and supervisor encouragement, provision of sufficient resources and the freedom to suggest and initiate new ideas. The respondents indicated that the most important factor in developing a creative and innovation organisational culture to be freedom to suggest and initiate new ideas without intimidation from supervisors.

Concerning the effect of intellectual property on creativity and innovation, majority of the respondents agreed that IP benefits society by adding value and providing a guarantee of quality, IP laws help to protect the creative works of innovators, high cost of original works contribute to public desire’s for pirated products and lack of IP protection creates a massive drain on national economies. However, they disagreed that the purpose of IP was to enrich a few at the expense of many and that there’s presence of public education in Kenya concerning the potential benefits of IP.

5.3 Discussion

This section seeks to discuss the findings of the research as depicted in chapter 4 of this report. The findings will be discussed in line with the research questions and in comparison to the findings of other researchers or theoretical background as indicated in the literature review in chapter 2.

5.3.1 Impact of Education System on Creativity and Innovation

The average number of years spent by an individual in a learning institution is 12 to 16 years. It is therefore expected that these years will contribute a great deal in the development of the individual’s critical thinking and creative abilities. The curriculum offered, teaching methodology and techniques, quality of services and examination focus are the main areas which impact on the creativity and innovation abilities of the students.

The findings of this study agree with those of Maisura (2005) that the superfluity of centralized testing regimes has turned education into a game where teachers teach the art of passing exams, and pupils realize the academic dangers of nonconformity. Majority of
the respondents believed that the exams tested on ability to memorise the curriculum rather than the ability to apply the knowledge. It is in this same light that the respondents' proposed the main area of change in the Kenyan education system to be teaching and examination of practical and technical knowledge that can be applied in the solving of real world problems.

The findings of this study also indicated that application of ICT as a learning technique was insignificant in the current Kenyan education system. The need to apply ICT in learning is vital especially in the 21st century where such skills are a daily necessity and have contributed to efficient and effective service delivery in various industries. This study’s findings therefore agree with those of Seery, Canty and Dunbar (2010) which found that Ireland’s commitment to significant educational reform in technological education in the recent years encourages students to become enterprising, creative and empowered during their learning experience. The critical aims of these new syllabi display how the focus of technology education has changed, and now focusing on endorsing a cohort of students to be equipped with skills of design and realisation and the ability to apply these skills by thinking and acting imaginatively and creatively. Through the technology subject area it is recognised that students are presented with a learning environment that is not as rigid as other areas of the curriculum. Therefore educational outcomes of creativity, autonomy, fulfillment etc. are essential elements of a broad and balanced curriculum. Technology Education is recognised as a fundamental discipline within the Irish Education System. The strength of Technology Education and the quality of the students graduating from courses of study in the third level institutes in the country is often seen as one of the main reasons for Ireland’s previous economic success.

The findings of this study also concur that the outcome of an effective education system which is practical and incorporates ICT will make Kenya internationally competitive in the years to come. It agrees with the study of Tan and Gopinathan (2000) where the Ministry of Trade and Industry’s Economic Committee recommended the education of each individual to his or her maximum potential and the development of creativity and flexible skills to maintain Singapore’s international competitiveness in the global economy.
5.3.2 Impact of Organisational Environment on Creativity and Innovation

The findings of the study showed that most of the respondents were accorded support and encouragement from the corporate level management to be creative. A correlation was found to exist between corporate level and supervisor encouragement of encouraging staff to be creative. A correlation was also observed between corporate level encouragement towards creativity and provision of sufficient resources to promote creativity as well as presence of a proactive learning culture.

The ‘creative climate’ is a term coined by Ekvall in defining how an organization’s culture manifests itself in the creative output from its employees (Ekvall, 1997). Ten factors are listed which collectively describe the creative climate of the organization. These factors are: challenge, freedom, idea support, trust/openness, dynamism/liveliness, playfulness/humour, debates, conflicts, risk taking and idea time. With the exception of conflicts, each factor is viewed as having a positive impact on creative output. The findings of this study concur that presence of idea support, openness and freedom to suggest and initiate new ideas by corporate level management promote a creative and innovative organizational culture. The support of corporate level management does reflect in the supervisors’ support as well as provision of sufficient resources.

The researcher also had similar findings with those of Yeh-Yun Lin and Liu (2012). We found that the stimulants of creativity climate had stronger relationships with employee innovation than did the obstacles. The results clearly indicate the importance of the five stimulant factors: organizational encouragement, supervisory encouragement, work group support, sufficient resources and challenging work.

The findings of the study also indicated that most of the respondents were motivated by job satisfaction. This was consistent with the theory of Amabile (1992) that people will be most creative when they feel motivated primarily by the interest, satisfaction, and challenge of the work itself and not by external pressures i.e. extrinsic motivation. In fact, many studies indicate that creative behavior is influenced by employee motivation (Griffin and Neal, 2004); (Shalley and Gilson, 2004). Among these variables, motivation in particular is seen as a crucial mediator of the relationship between climate and performance.
The findings of this study also find a correlation between corporate level support in encouraging creativity and promoting a proactive learning culture. This is in line with the findings of W.K. Kellogg Foundation (2008) which stated that creating an innovative culture is totally intertwined with creating a learning culture. For some organizations the language about “learning organizations” has already grown tiresome. And yet innovation is fundamentally about effective learning. Intentional learning processes help to identify the full potential of deliberately developed innovation or to discover the value of an accidental idea. Without a learning culture that is constantly looking for patterns in activities, refining and improving activities, and sifting for the meaning of things, organizations frequently end up losing or warehousing their best information and knowledge. Systematizing innovation requires more attention to the learning culture i.e. a work environment that promotes collaborative inquiry, experimentation, tolerance for risk, and an acceptance of and commitment to learning from setbacks or failures. Understanding the creation of learning cultures that go beyond mere information systems will be as important to understanding innovation as direct research on innovation itself.

5.3.3 Effect of Intellectual Property Legislation on Creativity and Innovation

The findings of the study indicated that 29 percent of all respondents strongly agreed and 58 percent agreed that IP benefits society by adding value and providing a guarantee of quality. These findings concur with the report of the International Chamber of Commerce (2005) which states that Intellectual property is unique, as it is the fruit of personal creation and inventiveness. It might be a poem that you write, the name your hairdresser thinks up to sell his or her services, or a mother’s invention for a non-spill cup for babies. It can also be a Picasso painting, an Akira Kurosawa film, a Naguib Mahfouz novel, a new method of irrigation for farmers in arid regions, the invention of the light bulb, a computer chip or a jet turbine engine. In virtually every instance, intellectual property stimulates progress, transforming society and adding value to our lives.

The findings of this study showed that 92 percent of the respondents believed that intellectual property rights are an incentive to innovators. The findings of Centi and Rubio (2005) concur with those of this study that state to capture the source of the innovative activities, special emphasis is given to creative ideas and human capital. Moreover intellectual property rights are introduced as the sole stimulus for innovation.
The underlined significance of protection of inventors is associated with the public good property of knowledge and creative ideas. Non-rival and non-excludable good property discusses that, under perfect competition and absence of protection of intellectual property rights, there will not be enough motivation for inventors to create. These findings also concur with the report of the International Chamber of Commerce (2005) that one purpose of the intellectual property rights system is to provide incentives to innovators to produce new inventions and creations. This in turn provides society with a steady stream of innovations that fuel economic, cultural and social progress and help to alleviate poverty and disease, and enrich our cultural heritage. By according these rights, society provides an incentive for people and organizations to invest time, resources and original thinking to develop innovative products and technologies and expand knowledge and culture.

In this study, 78 percent of all the respondents agreed that there exists a correlation between protection of IP rights and national competitiveness. These findings agree with those of the World Economic Forum Global Competitiveness (2005) which indicates that in 2004, the 20 countries that were perceived as having the most stringent intellectual property protection were classed among the top 27 in the WEF’s growth competitiveness index. Conversely, the 20 countries perceived as having the weakest intellectual property regimes were ranked among the bottom 36 for growth and competitiveness. Therefore, there is a correlation between the protection of intellectual property rights and national competitiveness.

The findings of this study indicated that 26 percent of all respondents strongly agreed while 48 percent agreed that lack of IP protection creates a massive drain on national economies. These findings concur with those of the International Chamber of Commerce (2005) that every industry sector is affected, including airplane and car parts, food, batteries, medicines, film, music, publishing and toys. Collectively, the wider economic, social and developmental costs create a massive drain on national economies, especially those struggling to develop.

85 percent of the total respondents who participated in this study believed that IP rights were not respected in Kenya while 15 percent believed they were respected. There is therefore great need for the Kenya government to develop and implement various policies.
to help protect these rights. The International Chamber of Commerce (2005) in its report stated that Intellectual Property, properly managed, can be a powerful tool for growth and progress. To fulfill its potential, intellectual property protection has to be supported by appropriate policies and a deep commitment by governments to establish an effective infrastructure to process and make use of intellectual property rights. Suggested measures include: providing for clear and enforceable intellectual property rights ownership, establishing an active and coherent intellectual property policy coordinated throughout government bodies; educating local communities, businesses and the public on the potential benefits of the intellectual property system.

5.4 Conclusion
The purpose of the study was to establish the factors that enhance and nurture creativity and innovation in Nairobi GIS firms. The following are the conclusions which are based on the research questions and drawn from the findings of the survey that was conducted.

5.4.1 Impact of Education System on Creativity and Innovation
The findings of this study show that there is a great impact of the education system of a nation on the level of creativity and innovation of a country. The respondents of this study agreed that creative thinking was encouraged in the education system and quality was applied. The majority of the respondents agreed that use of ICT in the learning process was found to be minimal yet very necessary in enhancing creativity and innovation. The education system was also found to have focused on encouraging and testing the ability of students to memorise theories rather than testing the ability to practically apply the knowledge acquired. There is an urgent need for the government to embark on reforms in the Kenyan education system.

5.4.2 Impact of Organisational Environment on Creativity and Innovation
The organisation environment contributes to the creativity and innovation ability of the staff of an organisation. The corporate level management's promotion and encouragement of creativity and innovation in the organisation is vital. This has a direct correlation to the attitude of supervisors towards creativity and innovation as well as provision of sufficient resources to facilitate this. Promotion of freedom to suggest and initiate new ideas without discrimination is also a major contributor in enhancing creativity and innovation.
in the organisation. This responsibility lies with the corporate level management as well as the supervisors. The presence of a learning culture in the organisation is also a necessity in enhancing creativity and innovation.

5.4.3 Effect of Intellectual Property Legislation on Creativity and Innovation

The researcher also set to find out the effect of intellectual property legislation on creativity and innovation. The results indicated that intellectual property does serve to benefit the society by adding value and providing a guarantee of quality. In addition to this, IP laws also protect the creative works of innovators. The lack of IP protection has a nationwide effect of draining the economy as well as posing significant risks to consumers of counterfeit products. Despite the beliefs of some individuals, the purpose of IP laws is not to enrich few individuals at the expense of many. However, these innovators should not take advantage of the public by overpricing their products because this high cost of original works does contribute to the public’s desire for pirated products.

5.5 Recommendations

5.5.1 Recommendations for Improvement

5.5.1.1 Impact of Education System on Creativity and Innovation

This study has confirmed that the education system of a nation does greatly impact on the level of creativity and innovation of its citizens. It is important for the curriculum and teaching techniques to enhance critical and creative thinking ability of its students as well as development of their practical skills. The services that are offered to the students should be of quality and ICT should be applied in the teaching methodology. The researcher therefore recommends that the teaching staff, administrators and policy makers uphold this responsibility. They also need to review the examination system to ensure that it focuses on testing the application abilities of the students not just the ability to memorise theories.

5.5.1.2 Organisational Environment on Creativity and Innovation

The result of this study have highlighted the impact an organisation environment has on the staff’s ability to be creative and innovative. The researcher recommends that the responsibility of nurturing a creative and innovative working environment be borne by the
corporate level and middle management. Of critical importance is the need to encourage the staff to be creative by providing them with the freedom to initiate and implement new ideas without discriminating them as well as providing the resources required. The researcher also recommends that the management promote and develop a learning culture in order to keep abreast with the evolving needs of the consumers which provide vast opportunities for business. The findings also showed that majority of the respondents take great pride in the work they do such that their greatest motivation is job satisfaction. Thus, presence of the aforementioned qualities in the work environment will go a long way to benefitting the individual, the organisation, the nation and the world through the innovations that will be birthed.

5.5.1.3 Intellectual Property Legislation on Creativity and Innovation

The findings of this study also found that protection of intellectual property does provide an incentive to innovators as well as enabling them to reap the fruits of their resources and hard work invested. Unfortunately, in Kenya, most of the people including those who participated in this research have little knowledge of what intellectual property is and therefore do not respect it. The researcher thus recommends that more plans be implemented by the legislators and regulatory bodies such as the Copyright Society to educate the public about the intellectual property rights, their potential benefits and also ensure that the consequences of breaching these laws are known and effected. There is also need to regulate the pricing of the innovated products to ensure that the public are not taken advantage of as well as negating the desire for pirated products. It is certain that with the development of an education system and organisation environment that nurtures and enhances creativity and innovation, all efforts must be implemented to ensure that the innovators works are protected so that they can eat the fruits of their diligent works and resources.

5.5.2 Recommendations for Further Research

Various studies have been done especially in the western world concerning nurturing creativity and innovation. However, the researcher recommends that more studies should be done in Africa and specifically in Kenya so as to ascertain whether the factors identified also apply to the other business industries.
REFERENCES


APPENDIX

Appendix A: Questionnaire

A. Demographics

Gender:  a) Male       b) Female
Age:      a) Below 25   b) Between 25-29  c) Between 30-35  d) Above 35

B. Impact of Education System on Creativity and Innovation

1. Which system of education did you go through?
   a) 7-4-2-3       b) 8-4-4       c) GCSE     d) Other

2. Using the scale provided indicate your opinion of the listed statements regarding the education system you went through

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creative thinking was encouraged</td>
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<td>Quality services were offered</td>
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<tr>
<td>ICT was applied in the teaching</td>
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<tr>
<td>Arts and crafts were encouraged</td>
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<tr>
<td>Extra-curricular activities were encouraged</td>
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<td>Exams tested memory ability</td>
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<td>Exams tested application ability</td>
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<td>I was well equipped for my career</td>
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</table>

3. Do you believe there is need for Education reforms in Kenya? a) Yes   b) No
If yes, which main area would you propose changes?

What is the highest level of education you have completed?
- Certificate
- Diploma
- Undergraduate
- Postgraduate
- Doctorate

4. What is your desired level of education?
- Certificate
- Diploma
- Undergraduate
- Postgraduate
- Doctorate

5. What motivates you most to desire a higher level of education?
- Academic Qualification
- Skills Development
- Employment Promotion
- Salary raise
- Other

C. Impact of Organisational Environment on Creativity and Innovation

1. Indicate your opinion about the following statements concerning your organisation’s environment:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>There’s corporate (managerial) level encouragement towards creativity</td>
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<tr>
<td>My supervisor encourages me to be creative</td>
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<tr>
<td>I receive group support at my work</td>
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<tr>
<td>Sufficient resources are available to facilitate creativity and innovation</td>
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<tr>
<td>There’s freedom to suggest and initiate new ideas</td>
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<tr>
<td>I thrive well under workload pressure</td>
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</table>
A proactive learning culture is present

2. What is your greatest source of motivation at work?
   a) Salary  b) Job satisfaction  c) Promotion opportunities  d) Recognition  
   Other

3. Do you consider yourself as naturally curious?  a) Yes  b) No

4. Does your level of creativity affect your performance?  a) Yes  b) No

5. What do you consider to be the most important factor in developing a creative and innovative organisation culture?

D. Effects of Intellectual Property Legislation on Creativity and Innovation

1. Indicate your opinion about the following statements concerning intellectual property rights

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP benefits society by adding value and providing a guarantee of quality</td>
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<tr>
<td>IP rights allow innovators and creators to choose the terms on which they distribute their work</td>
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<tr>
<td>IP laws protect the creative works of innovators</td>
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<tr>
<td>The purpose of IP is to enrich the few at the expense of the many</td>
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<tr>
<td>The high cost of original works contribute to public’s desire for pirated products</td>
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<tr>
<td>Lack of IP protection creates a massive drain on national economies</td>
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</tbody>
</table>
Piracy and counterfeiting lead to loss of lawful employment

Counterfeit products are posing significant risks to consumers

There is public education concerning potential benefits of IP

2. Do you consider intellectual property rights to be an incentive to innovators?
   a) Yes   b) No

3. Do you find a correlation between protection of intellectual property rights and national competitiveness?
   a) Yes   b) No

4. Which of the following statements do you consider to be true?
   a) Intellectual property rights are respected in Kenya
   b) Intellectual property rights are infringed in Kenya

If your answer is b) what do you consider to be the main reason for this?