Influence of Technological Innovation on Competitiveness of Universities in Nakuru Town, Kenya

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Abstract— **In an era of globalization, deregulation, increasing competition, new technologies and ecommerce, organizations are finding it harder to compete. Firm is said to be competitive when it develops and exploit their own unique resources and capabilities than to be excellent in how it imitates the resources and capabilities of other firms. The objective of the study was to examine the influence of technological innovation on competitiveness of universities in Nakuru, Kenya. More specifically, the study determined the influence of online teaching platforms and smart boards on competitiveness of universities in Nakuru, Kenya. The study was guided by Technology Acceptance Model. The study used descriptive research design. The target population of the study was 62 staff in six campuses in Nakuru town of diverse universities serving as chair of departments, registration staff, and director of online learning from universities in Nakuru town Kenya. Due to the low number of the target population a census method was used to select the sample members to be used in the study. In this context a sample size of 62 respondents was used for the study. Questionnaires structured in a 5-point Likert scale were used for data collection. Questionnaires were tested for reliability and validity. Cronbach alpha coefficient was used to indicate the reliability of the research instrument. The collected data was analyzed using Statistical Package for Social Sciences (SPSS) software. Data was analyzed using descriptive statistics which included frequency, chi square, correlational analysis and regression analysis.The study concluded that online teaching had a positive and significant relationship with the competitiveness of the universities. The study concluded that smart boards had a positive and significant relationship with the competitiveness of the universities. The study recommended that, management information systems, online teaching platforms should be considered as items for ensuring competitiveness of universities in Nakuru. In particular, the universities should focus on management information systems and online teaching platforms. The role of the diverse aspects of technological innovation should be examined in a holistic manner in diverse aspects of student life facets to examine on how they influence competitiveness of those universities.**

Index Terms— **Competitiveness, Online Teaching, Technological Innovation, Telecommuting, Universities.**

I. INTRODUCTION

Innovation and technology have played a key role in many organizations in the current demanding and dynamic business environment by enabling companies to use business analytics systems to create value and gain competitive advantage through improvements in organizational processes and enhanced decision making. These systems help them to respond quickly to environmental changes and varying customer demands as well as market differentiation by enhancing their customer service and providing superior products and services. Decision makers can use the advanced statistical and quantitative analysis techniques inherent in these systems as well as explanatory and predictive modelling to support their decisions (Shanks, Bekmamedova, &Willcocks, 2013).

The demand for university education in Kenya has increased in the past few decades (Kivati, 2017). The progress in the reforming of education system has so far been made in realization of vision 2030 goals as is based on leveraging creative learners capable of raising Kenya's competitiveness. The pressure arising from a changing global higher education landscape has an impact on the delivery of educational services due to economic, technological, political, cultural and scientific trends placing new demands on Kenya's education system.

Sewang et al (2011) carried out a research on effects of innovations on SMEs using the balanced approach. The research was conducted in Australia and Thai SMEs. The balanced approach utilized both financial and non-financial metrics to capture full potential benefits of implementing innovations. The effects of innovations were determined using the following metrics customer satisfaction, sales revenue and growth, return on investment, product/service quality and profit margin. They established that SMEs took a balanced approach which was more likely to perceive benefits of implemented innovations compared to using financial measures only.

Agboola (2006), in his study on Information and Communication Technology (ICT) in Banking operations in Nigeria using the nature and degree of adoption of innovative technologies; degree of utilization of the identified technologies; and the impact of the adoption of ICT devices on banks, found out that technology was the main driving force of competition in the banking industry. During his study he witnessed increase in the adoption of ATMs, EFT, smart cards, electronic home and office banking and telephone banking. Anbalagan (2011) finds that some types of financial innovations are driven by improvements in computer and telecommunication technology and argues that for most people the creation of the Automated Teller Machines was greater financial innovation than asset backed securitization Walobwa et al, (2013) categorized innovation into technology, marketing, administration and strategic innovations. The research aimed at evaluating each type of

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innovation and how it attributed to the growth of the garment SMEs. The sample size was 31 garment SMEs in Jericho market Nairobi. The dependent variable represents enterprise growth and independent variables represent different types of innovation. The found that technological, administrative, marketing and strategic innovation contributed to 56% of variations in growths of SMEs. In addition they established that market innovation contributes most to growth of SMEs but it was less emphasized.

In the Kenyan context universities should therefore be in the forefront of Research and Development as this is the main avenue through which Innovations can be achieved and this will spur growth both at the University level as well as in the Country. Moreover, universities should cultivate an enabling environment that is appropriate for innovation, keeping in view their specific features without replacing the same or competing with other activities. Universities ought to take up a leading role in the practical innovation process based on the ideal that universities are generators of knowledge, which when suitably processed become capable of producing direct societal benefits (Njoro, 2017).

A. Statement of the Problem
The current operational set up in Kenya's education sector is a dynamic one and highly competitive with the emergence of many universities. The privatization of university education and linearization of student selection since the formation of commission of University Education in 2012 changed the environment in which the public universities operated. To ensure survival and sustainability in the market place, the public universities need to adopt competitive strategies to ensure that they outperform their competitors. A number of studies have been done on competitive strategies but under different contexts in Kenya. Murage (2011) analyzed the competitive strategies in the petroleum industry and found that service stations use differentiation as a method of obtaining competitive advantage over other service stations. Gathoga (2011) focused on competitive strategies by commercial banks in Kenya. The study revealed that banks in Kenya use various means in order to remain competitive, he also concluded that expansion into other areas by opening new branches has also, been used as a strategy. Its notable that whereas studies have done on competitive strategies, there still lacks sufficient research in the same line in universities. This study sought to establish the influence of technological innovation on competitiveness of universities in Nakuru town, Kenya.

B. Objectives of the Study
i. To examine the influence of online teaching platforms on competitiveness of universities in Nakuru Town, Kenya.
ii. To evaluate the influence of smart boards on competitiveness of universities in Nakuru Town, Kenya.

C. Research Hypotheses
H0$_1$: Online teaching platform has no significant influence on competitiveness of universities in Nakuru Town, Kenya.
H0$_2$: Smart boards do not have a statistically significant influence on competitiveness universities in Nakuru Town, Kenya.

II. LITERATURE REVIEW
A. Theoretical Review
The paper was based on Technology acceptance model which was proposed by Davis in 1989. TAM is an adaptation of the Theory of Reasoned Action and was designed to understand the causal chain linking external variables to its user acceptance and actual use in a work place. External variables such as objective system characteristics, training, computer self-efficacy, user involvement in design, and the nature of implementation process are theorized to influence behavioral intention to use, and ultimately usage, indirectly via their influence on perceived usefulness and perceived ease of use (Davis 1996). The theory is applicable due to the fact the study was examining the influence of technological innovation on the competitiveness of the university. In this context, the theory is applicable in this study because it examines the influence of online teaching platforms, smart boards and Management Information Systems (MIS). The adoption of these technological platforms is important in gaining competitive advantage of the universities..

The theory was also based on Diffusion of Innovation Theory which was originally developed by Rogers' in 1995. He defines diffusion as 'the process by which an innovation is communicated through certain channels over time among the members of a social society. According to DOI, the rate of diffusion is affected by an innovation's relative advantage, complexity, compatibility, trialability and observability. Rogers (1995) defines relative advantage as 'the degree to which an innovation is seen as being superior to its redecessor. The diffusion theory is relevant because it explains the reason why universities adopt technical innovations. One of the reasons why universities adopt technical innovations is relevant advantage. This means that universities that adopt technical innovations have relatively better competitive advantage than those who do not. The theory is applicable due to the fact the study was examining the influence of technological innovation on the competitiveness of the university. In this context, the theory is applicable in this study because it examines the influence of online teaching platforms, smart boards and Management Information Systems (MIS). The adoption of these technological platforms is important in gaining competitive advantage of the universities.

B. Online Teaching Platform and Competitiveness of Universities
The internet has become one of the vital ways to make available resources for research and learning for both teachers and students to share and acquire information (Richard and Haya 2009). E-learning is recognized worldwide in the form of easy learning approach. This is the learning procedure which is delivered through internet, laptops and wireless mobile handheld devices which allows learning anytime and anywhere. Electronic learning takes learning to persons, communities and countries have got previously too remote, socially or geographically, for other categories of educational initiative. Using e-learning can provide the quality education to remote and rural regions with the help of modern technologies like satellite, internet, and mobiles. E-learning involves a very wide range of applications. It includes

computational, communication technologies along with other modern devices like interactive TV etc (Ahmad &Mehedi, 2012).

Steele (2008) asserts that tutors need to understand how to teach students who do not learn as they once did and have grown up with high intensity stimuli such as games, downloads, iPods, blogs, websites, texts and who often have to 'power down' for class. Therefore much of the literature focuses on this existing use of technology as part of students' everyday activities and advocate connecting with this, embracing it and bringing it into the classroom (AnagnostopoulouParmarPriego-Hernandez 2009).Because today's children have grown up with a different digital landscape than their teachers (Jukes, 2008), they, most likely, are inspired and motivated by different technology. As students are already using social networking sites, the mobile devices to access them and conducting their lives via text, projects aim to build on what students are familiar with –both in terms of the environments/packages and the skills they have to use them (McDermott and Witt 2009). Studies urge learning from these 'digital natives' (Trinder 2008), tapping into the 'game generation' (Curran and Forbes 2007), or offering meaningful learning to the 'net generation' (Williams & Chinn 2009). They stress the need to harness and channel the skills of contemporary students, to understand and respond to their experiences (Munro 2006). Technology can therefore give an institution a presence in a large networking world and inspire students about their university and faculty and can even give it the 'cool' factor (Raths, 2009).

Technology is also seen as appropriate for 'today's' students who have different styles and expectations and who process information differently –such as preferring interactivity and immediacy (Williams and Chinn 2009) and who are using mobiles, IM and SMS more than (say) 'traditional' email. Similarly some suggest students prefer using their own choice of technology that links with their extra-curricular activities and peers (Dempster 2007), arguing that students are using these technologies whether staff like it or not and so institutions cannot ignore technology such as simple notification services (SNS) if they want to engage these students and make meaningful connections Bowers, Campbell (2008).

- **C.Smart Boards and Competitiveness of Universities**

Students' achievements increase significantly once interactive whiteboards are used for teaching purposes. Teachers who use smart boards in class report a rise in the quality of teaching. This rise is facilitated by the ability to conduct lessons that combine multimedia, which attract the students' attention and imagination in creative ways. The interactive whiteboard has the advantage of adapting the manner in which the study material is conveyed to the students' personal learning style (Becker & Lee, 2009).

The major contribution of smart boards is that they afford choices on various topics, contribute to understanding the material, to developing knowledge, organizing information, self-efficacy in carrying out assignments in a friendly environment, increase the efficiency of learning at any location and contribute to it, as well as to the representation of products that generate a sense of success, pleasure, and contribute to a more creative and higher standard learning product (Dori& Kurtz, 2015). Smart boards contribute significantly to both parents and students, and therefore it is necessary to add smart classrooms throughout the entire school system (Manny-Ikan et al., 2011). Clark (2012) claimed that the benefit of smart boards is that teachers can save comments and explanations on the smart board, and thus record lessons for future use by students who missed class due to an absence or illness.

However although many studies show that use of smart boards improves learning and makes teaching meaningful, a study that examined the ability to solve problems and thinking skills among students in smart classrooms and students in classrooms with regular boards, found that it was the students who study in classrooms with regular boards who were better off. Students who studied in smart classrooms claimed that there were often technical problems and that the teachers were not sufficiently proficient. Nonetheless, in a questionnaire on attitudes to learning, students in the smart classrooms claimed that the smart board encourages motivation to learn, raises the level of concentration, and has a strong effect on behavior (Shuck & Kearney, 2007).

Smart Class system is a key solution which is intended to support faculties and teaching assistants to overcome with their daily classroom and lab challenges and also improving student's academic interest and performance with easy, practical and significant use of technology. Smart Class helps faculties to make sure that every student in the class is getting knowledge, by providing the wide range of learning patterns in the classroom and in lab sessions. It is also very helpful in managing student's interest and engagement in learning within the classroom. Smart Class makes the problems easy for teacher, abstract curriculum concepts which are difficult to understand and imagine for students or relate by the use of 3D (three dimensional), interactive multi-media approach (Becker & Lee, 2009).

As indicated by Giles and Shaw (2011), the Smart Board is a valuable device to engage learners through the use of interactive instruction with hands on activities. This tool bridges different learning styles, interests of learners, abilities, along with their prior knowledge to review and practice on this electronic board with teacher and students. So it is called some times, the interactive white board (IWB). Smart board helps students who are visual learners by providing them with a variety of visuals ranging from text and pictures to the use of animation and video auditory learners also benefit from using the IWB through activities such as listening to sounds or music as part of a classroom presentation. Even tactile learners find the white board helpful as they physically interact with the whiteboard by touching and moving things on the screen (Beeland, 2002).

D. Competitiveness of Universities

To ensure survival and success, firms need to develop the capability to manage threats and exploit emerging opportunities promptly. This requires formulation of strategies that constantly match capabilities to environmental

requirements. Understanding competitiveness is a crucial process for decision makers and to make it more complicated is that the ability to develop a sustainable competitive advantage is increasingly becoming rare. Therefore, there is need for a sustained competitive advantage on enduring value differentiation between the services of the organization from those offered by the competitor in the views of the customers. As a result organizations must scan the environment in a proper manner to ensure that they anticipate what the rapidly changing environment will be like, and change their structures, cultures and other relevant factors so as to reap the benefits of the time (Peterraf, 2013).

Firm competitiveness has been measured using several financial indicators that include return on sales, return on assets, turnover. The advantage of financial performance measures is the easiness of computation as well as the presence of standardized universal definitions. Apart from financial indicators, several non-financial indicators have also been used to indicate competitiveness and these include market indicators like market share and market share growth of the firm (Liargovas&Konstantinos, 2009). For firm competitiveness, sales, volume, productivity and market share have been used as indicators.

Pelegrin and Antunes, (2013) state that a firm is considered innovative when it offers goods and services which did not exist previously, using a new or previously unused organizational method which aids in the production of a new product (nonexistent in the market by then). Ito, Hayashi, Gimenez and Fensterseifer (2012) state that the existing relation between innovation and competitive advantage is seen in the organization's fact to use more efficient its sources, in a way to manage them to generate innovations and those to be subjected to achieve competitive advantage.

Increasingly universities must provide quality and flexibility to meet the diverse needs of students. This will inevitably involve tailoring courses to suit differing educational needs and aspirations. Another implication of virtual learning is the increase of international competition for students by many universities; new communication methods are useful tools that encourage internationalization of tertiary learning (O'neill, Singh, O'donoghue, 2004). Many reasons account for the increasing growth of online courses and programs. Green (2010) reported that colleges and universities, looking

for ways to lower costs, are motivated to develop and grow their online programs. Forty-two percent of the ITC Survey participants identified the economic downturn as a reason for recent growth in online learning at community colleges (Trends in e-learning: Tracking the Impact of e-learning at Community Colleges, 2010).

- In her study on competitive strategies adopted by Universities in Kenya, Kitoto (2005) established that Kenyan universities use satisfactory quality of teaching and recognized degree with acceptable quality in order to achieve overall cost leadership. High teaching quality, highly skilled and competent lecturers and course content being covered within the prescribed time frame were the main ways Kenyan universities achieved differential advantage. In relation to focused strategy, it was observed that Kenyan universities mainly offered market driven courses and ensured flexibility on courses offered. Other competitive strategies employed by the universities were subsidizing fee for staff dependants, offering school based courses, employing lecturers on part time basis and publicity to create and enhance positive image of the university.

- **E. Research Gaps**

Most of the studies have focused on either of the two being either an independent variable of another variable or a dependent variable of another. This study will therefore look at the two together with the strategic leadership being independent of change management and establish the effect of leadership on strategic change management. The study will go further than Stoyanova, (2015) and establish more aspects of the leadership that affect change management. As has been witnessed in the empirical review, studies on the influence of leadership in the country are minimal. The studies conducted by (Hoque, 2014; Stoyanova, 2015;Alexander, 2015;Johansson, Miller, & Hamrin, 2014;Buchanan & Huczynski, 2013) etc. were based in developed economies. Locally, there is no study that has looked at the influence of leadership on strategic organizational change from the point of view of County governments. This study therefore, will seek to fill the knowledge gap by establishing the overall objective of this study which is to investigate the influence of leadership on strategic organizational change in Nakuru county government.

F. Conceptual Framework
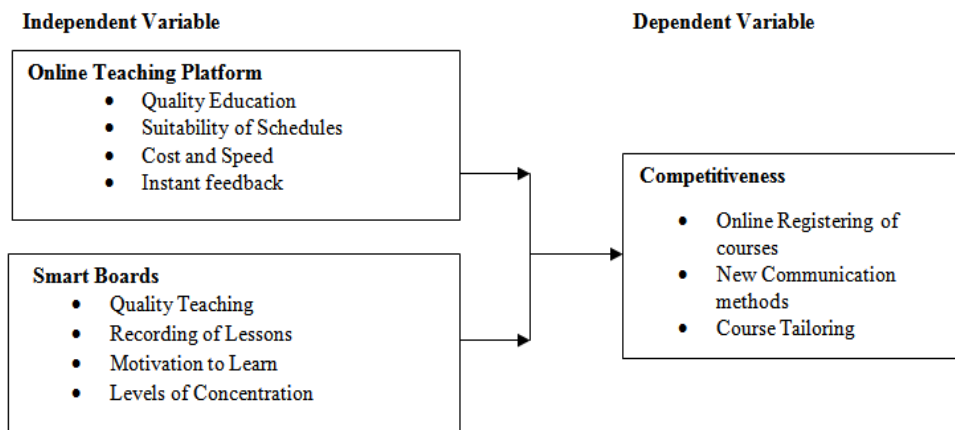
III. METHODOLOGY

The study employed a descriptive survey research design. The design allows the researcher to expose the respondents to a set of questions to allow comparison. The study was conducted in Nakuru Town. The town is a centre of academics with campuses for the University of Nairobi, Kenyatta University, Jomo Kenyatta University of Science and Technology, Mount Kenya University, Laikipia University, Kenya Methodist University being set up in the town. This study focused on all administrative staffs working in universities in Kenya. Thus the target population of the study was the chair of departments, registration staff, and director of online learning from universities in Nakuru town Kenya. There are six campuses operating in Nakuru town which include Kabarak, Kenyatta, St. Pauls, Mount Kenya, Egerton and Jomo Kenyatta. The six campuses have a total of 62 staff working in campuses in Nakuru town Kenya who served as either chair of departments, registration staff, and director of online learning aspects. Due to the low number of the target population a census method was used to select the sample members to be used in the study. In this context a sample size of 62 respondents was used for the study. This sample size was arrived at through picking all the members of the population since the population was very small. The study used structured questionnaires that were distributed to all the administrative staff in the seven universities in Nakuru town. The instrument was taken for piloting where 10% of the population size was used and later excluded from the final data collection. Piloting of the instruments was done to assist the researcher in testing both the validity and reliability of the instruments. The researcher consulted supervisors and other lecturers from the Department to scrutinize the relevance of the questionnaire items against the set objectives of the study. For purposes of determining the reliability of the instrument, Cronbach's coefficient Alpha was computed. Data collected was processed and analyzed based on the objectives and research hypotheses using Statistical Package for Social Sciences (SPSS) version 21. This was done using both descriptive and inferential statistics. Descriptive statistics (percentages, frequencies, and chisquare analysis) presented in tables were used to organize and summarize data and to describe the characteristics of the sample. The frequencies showed popularity of a given response amongst the respondents. Chi-square analysis was utilized to determine whether two categorical variables were associated

IV. RESULTS

A. Response Rate

The study targeted 62 administrative staff working in campuses in Nakuru town, however, only 56 of the administrative staff returned their questionnaires as some respondents were not keen in taking care of the questionnaires and misplaced them.

Gender of Respondents

Distribution by Gender of Respondents

35%
65%
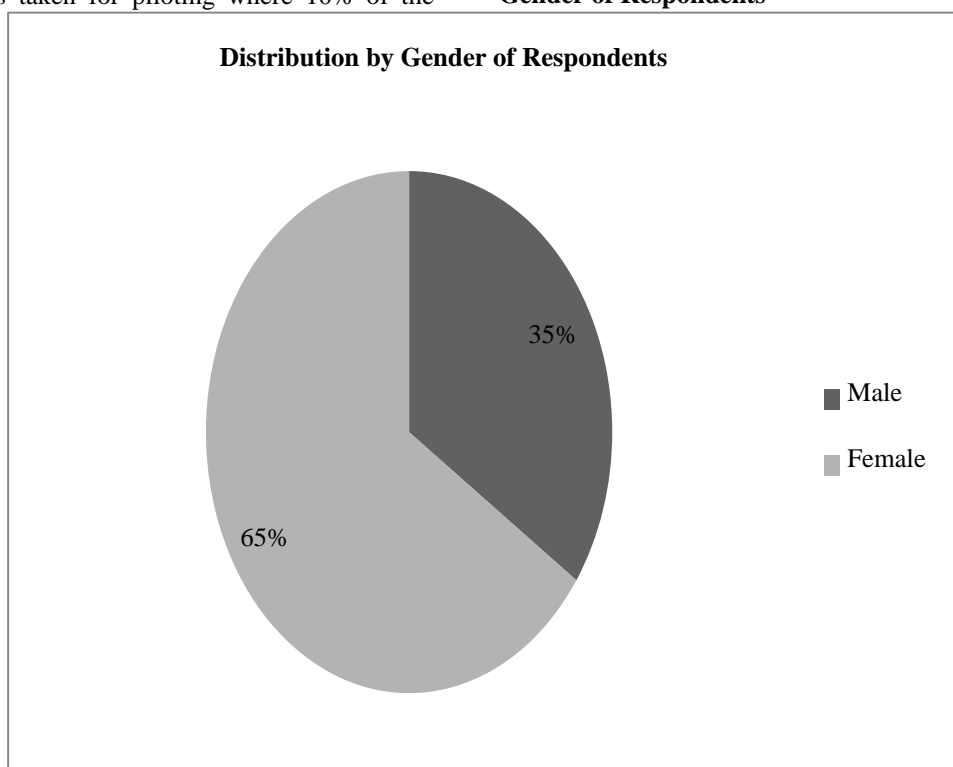
■ Male
■ Female

Pie Chart Showing Distribution of Respondents by Gender

The study determined that most of the administrative staff working in campuses in Nakuru town Kenya were female (65.0%) while the male staff were 35.0%. This could be attributed to more female preferences towards working in administrative roles as the working environment in these roles favors them.

Distribution of Respondents by Age
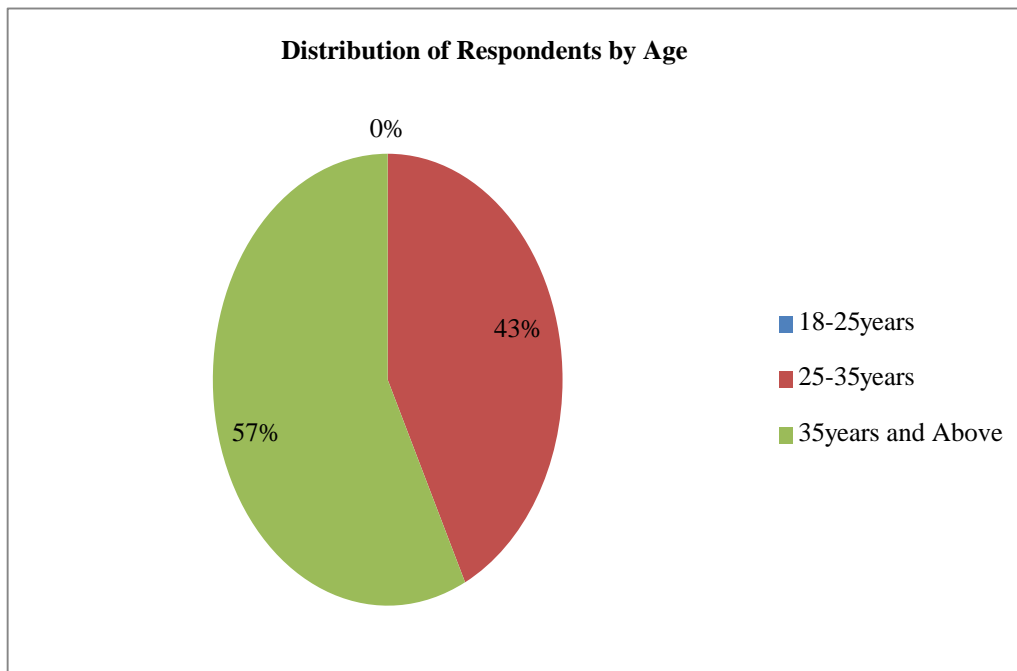
Pie Chart Showing Distribution of Respondents by Age

The study found that above half of the administrative staff working in campuses in Nakuru town Kenya were 35 years of age and above (57.0%). There was no staff in administration who was 18-25 years of age (0.0%) in campuses in Nakuru town Kenya. The study also established that administrative staff working in campuses in Nakuru town Kenya ages 25-35 years was 43.0% of the total staff in administration at the campuses. The administrative staff in the universities were found to be 25 years and above. The skills required to be able to perform administrative functions in the university would require the person to graduate from a tertiary education institution thus which could attribute the respondents being at least 25 years of age.

Frequencies, Chi Square values, and p-value for Online Teaching Platforms

	SD	D	U	A	SA		P
	%	%	%	%	%	χ^2	Value
Online teaching has enabled learners and teachers to share information despite the distance	1.9	5.7	7.5	67.9	17.0	13.685	0.000
With the help of modern technology e-learning has provided students with quality education	3.8	13.2	9.4	62.3	11.3	12.441	0.000
Online teaching has enabled universities to reach learners who are in remote areas	9.4	7.5	3.8	73.6	5.7	13.575	0.000
E-learning has enabled students to receive feedback instantly from the teachers	5.7	15.1	1.9	67.9	9.4	15.586	0.000
Online teaching has helped the tutors and learners to cut costs associated with transport	0.0	11.3	9.4	64.2	15.1	18.711	0.000
E-learning has empowered students to acquire their education and at the same time perusing other personal business	7.5	3.8	5.7	75.5	7.5	17.999	0.000
Online teaching platform has increased the 11.3 speed of information sharing	1.9	.0	69.8	17.0		13.939	0.000

In respect to whether online teaching has enabled learners and teachers to share information despite the distance, most of the respondents (67.9%) tended to agree that it has. Some respondents (17.0%) tended to strongly agree that online teaching has enabled learners and teachers to share information despite the distance. There were 7.5% of respondents who were undecided on the statement, 5.7% who disagreed with the statement and 1.9% who strongly disagreed with the statement. The ability of the university to share information in spite of distance was found to be significantly associated with its competitiveness in Nakuru Town, Kenya ($\chi2(4) = 13.685$, $p = 0.000$). These results were consistent with the assertions of Richard and Haya (2009). Richard and Haya (2009) noted that Internet has become one of the vital ways to make available resources for research and

learning for both teachers and students to share and acquire information (Richard and Haya 2009).

E-learning is recognized worldwide in the form of easy learning approach. This is the learning procedure which is delivered through internet, laptops and wireless mobile handheld devices which allows learning anytime and anywhere. Electronic learning takes learning to persons, communities and countries have got previously too remote, socially or geographically, for other categories of educational initiative. Using e-learning can provide the quality education to remote and rural regions with the help of modern technologies like satellite, internet, and mobiles. Elearning involves a very wide range of applications. It includes computational, communication technologies along with other modern devices like interactive TV etc (Ahmad &Mehedi, 2012).

Most of the study respondents tended to agree that modern technology e-learning has helped universities in Nakuru Town, Kenya students with quality education. This was also strongly perceived to be true by 11.3% of the respondents who chose "strongly agree". Some respondents were not of this opinion and tended to disagree (13.2%) and strongly disagree (3.8%) indicating that modern technology e-learning has not helped universities in Nakuru Town, Kenya students with quality education. There were also a few respondents who were undecided on the matter (9.4%). Modern technology e-learning was found to have a significant relationship with competitiveness of universities in Nakuru Town, Kenya ($\chi2(4) = 12.441$, p = 0.000).

Online teaching was perceived to enable universities in Nakuru Town, Kenya reach learners who are in remote areas by 73.6% (agree) and 5.7% (strongly agree) of the respondents. Respondents who perceived that online teaching did not enable universities in Nakuru Town, Kenya reach learners who are in remote areas were 7.5% of respondents who chose "disagree" and 9.4% of respondents who chose "strongly agree". A few respondents (3.8%) tended to be undecided on whether online teaching has enabled universities to reach learners who are in remote areas. The results of the Chi Square test of independence revealed that a relationship exists between ability of the university to reach learners in remote areas and its competitiveness in Nakuru Town, Kenya ($\chi2(3) = 13.575$, p = 0.000).

A cumulative majority of respondents tended to agree (67.9%) and strongly agree (9.4%) that e-learning universities in Nakuru Town, Kenya has enabled students to receive feedback instantly from the teachers. Respondents with opposite perceptions were those who tended to disagree (15.1%) and strongly disagree (5.7%) indicating that students are not able to receive feedback instantly from the teachers through e-learning at universities in Nakuru Town, Kenya. There were some respondents who tended to be undecided on the matter.

The study revealed that instant feedback from the teachers to students has a significant relationship with competitiveness of universities in Nakuru Town, Kenya ($\chi2(4) = 15.586$, p = 0.000). This is in agreement with Steele (2008) asserts that tutors need to understand how to teach students who do not learn as they once did and have grown up with high intensity stimuli such as games, downloads, iPods, blogs, websites, texts and who often have to 'power down' for class. Therefore much of the literature focuses on this existing use of technology as part of students' everyday activities and advocate connecting with this, embracing it and bringing it into the classroom (AnagnostopoulouParmarPriego-Hernandez 2009).

Today's children are most likely inspired and motivated by different technology because they have grown up with a different digital landscape than their teachers (Jukes, 2008). As students are already using social networking sites, the mobile devices to access them and conducting their lives via text, projects aim to build on what students are familiar with. This is both in terms of the environments/packages and the skills they have to use them (McDermott and Witt 2009).

The study established that online teaching has helped the tutors and learners to cut costs associated with transport as perceived by 64.2% of the respondents. Further, 15.1% of the respondents strongly shared this view. On the other hand, only 11.3% of the respondents felt that online teaching does not help the tutors and learners to cut costs associated with transport, although no respondent strongly shared this opinion (strongly disagree=0.0%). Some respondents were undecided on the matter. Costs associated with transport were found to have a significant relationship with competitiveness of universities in Nakuru Town, Kenya ($\chi2(4) = 18.711$, p = 0.000).

About three quarters of the respondents (75.5%) tended to agree that e-learning has empowered students to acquire their education and at the same time perusing other personal business as was also strongly perceived by 7.5% of the respondents. On the other hand, 3.8% and 7.5% of the respondents tended to disagree and strongly disagree with the statement, respectively. The study found a significant relationship between suitability of schedules competitiveness of universities in Nakuru Town, Kenya ($\chi2(4) = 17.999$, p = 0.000).

The speed of information sharing was perceived to have been increased through the online teaching platform in universities in Nakuru Town, Kenya by 69.8% and 17.0% of the respondents who chose "agree' and "strongly agree", respectively. On the other hand, the speed of information sharing was perceived not to be increased through the online teaching platform in universities in Nakuru Town, Kenya by 1.9% and 11.3% of the respondents who chose "disagree' and "strongly disagree", respectively. No respondent was undecided on the matter (0.0%). The speed of information sharing was found to have a significant relationship with competitiveness of universities in Nakuru Town, Kenya ($\chi2(4) = 13.939$, p = 0.000).

Frequencies, Chi Square values, and p-value for Smart Boards

	SD	D	U	A	SA		
	%	%	%	%	%	χ^2	P Value
Quality of teaching in universities has increased due to use of smart boards	9.4	5.7	3.8	73.6	7.5	21.871	0.000
Lecturers in universities use smart boards to record information for future use by students	1.9	3.8	9.4	71.7	13.2	16.773	0.000
Smart class has improved academic performance of learners in universities due to use of technology	5.7	9.4	5.7	67.9	11.3	19.364	0.000
Use of smart boards in universities has encouraged motivation of learners because learners are interested to learn through use of smart boards	7.5	11.3	7.5	64.2	9.4	10.056	0.001
Smarts boards has contributed to understanding of the material and increasing efficiency of learning at any location	3.8	5.7	13.2	67.9	9.4	19.592	0.000
Smart board has helped students with different learning style to acquire information by using it	5.7	17.0	9.4	54.7	13.2	17.3623	0.000
Use of smart boards has raised the level of concentration as smart boards have strong effect on behavior of the learner	1.9	13.2	11.3	58.5	15.1	21.871	0.000

In respect to improvement in quality of teaching due to use of smart boards, a majority of the respondents at 73.6% of the respondents agreed with the statements with a further 7.5% of the respondents strongly agreeing with the indicator. It was only 9.4% and 5.7% of the respondents who strongly disagreed and disagreed with the indicator respectively. The study found that quality of teaching using smart boards has a significant relationship with competitiveness of universities in Nakuru Town, Kenya ($\chi^2(4) = 21.871$; p = 0.000).

Students' achievements increase significantly once interactive whiteboards are used for teaching purposes. The role of technology and quality of education was in agreement with Becker and Lee (2009). Teachers who use smart boards in class report a rise in the quality of teaching. This rise is facilitated by the ability to conduct lessons that combine multimedia, which attract the students' attention and imagination in creative ways. The interactive whiteboard has the advantage of adapting the manner in which the study material is conveyed to the students' personal learning style (Becker & Lee, 2009).In regards to the recording of information for future use by the students, a cumulative percentage of 84.9% were in agreement with the indicator compared to 5.7% of the respondents who were in disagreement. A further 9.4% of the respondents were uncertain in respect to the influence of the indicator.

A significant relationship was found between recording information for future use and competitiveness of universities in Nakuru Town, Kenya ($\chi^2(4) = 16.773$; p = 0.000). The major contribution of smart boards is that they afford choices on various topics, contribute to understanding the material, to developing knowledge, organizing information, self-efficacy in carrying out assignments in a friendly environment, increase the efficiency of learning at any location and contribute to it, as well as to the representation of products that generate a sense of success, pleasure, and contribute to a more creative and higher standard learning product (Dori&

Kurtz, 2015). Smart boards contribute significantly to both parents and students, and therefore it is necessary to add smart classrooms throughout the entire school system (Manny-Ikan et al., 2011). Clark (2012) claimed that the benefit of smart boards is that teachers can save comments and explanations on the smart board, and thus record lessons for future use by students who missed class due to an absence or illness.

A majority of 67.9% agreed that smart class leading to improvement of academic performance of learners in universities due to use of technology. This is compared with 5.7%, 9.4%, 5.7%, and 11.3% of the respondents who strongly disagreed, disagreed, were uncertain and strongly agreed respectively. The study found that use of technology through smart class has a significant relationship with competitiveness of universities in Nakuru Town, Kenya ($\chi^2(4) = 19.364$; p = 0.000). This is in agreement with the findings for Shuck and Kearney (2007). These scholars noted that use of smart boards improves learning and makes teaching meaningful, a study that examined the ability to solve problems and thinking skills among students in smart classrooms and students in classrooms with regular boards, found that it was the students who study in classrooms with regular boards who were better off. Students who studied in smart classrooms claimed that there were often technical problems and that the teachers were not sufficiently proficient (Shuck & Kearney, 2007).

In respect to the use of smart boards motivating learners as learners are interested to learn through smart boards 7.5%, 11.3%, 7.5%, 64.2%, and 9.4% of the respondents strongly disagreed, disagreed, were uncertain, agreed, and strongly agreed respectively. The study established that a significant relationship exists between competitiveness of universities in Nakuru Town, Kenya and motivation of learners through smart boards ($\chi^2(4) = 10.056$; p = 0.001). On the other hand, in respect to the smart board contributing to understanding of materials as well as increasing efficiency of learning at any

location 3.8%, 5.7%, 13.2%, 67.9%, and 9.4% of the respondents strongly disagreed, disagreed, were uncertain, agreed, and strongly agreed respectively. Results of the Chi-square test of independence shown in Table 4.2 indicate that a significant relationship exists between efficiency of learning at any location through smart boards and competitiveness of universities in Nakuru Town, Kenya (χ^2(4) = 19.592; p = 0.000).

A majority of 54.7% of the respondents agreed that smart board helping students with different learning style to acquire information by using it. This is compared to 5.7%, 17.0%, 9.4%, and 13.2% of the respondents who strongly disagreed, disagreed, were uncertain and strongly agreed respectively. The study established that a relationship exists between

learning style for acquiring information through smart boards and competitiveness of universities in Nakuru Town, Kenya (χ^2(4) = 17.3623; p = 0.000) which was found to be significant (p<0.05).

Finally, in respect to use of smart boards raising the level of concentration as smart boards have strong effect on behaviour of the learner a cumulative percentage of 73.6% of the respondents were in agreement with the metric. This is compared to 15.1% of the respondents who were in disagreement with the metric. A significant relationship was found to exist between ability of the smart board to influence the level of concentration of learners and competitiveness of universities in Nakuru Town, Kenya (χ^2(4) = 21.871; p = 0.000).

Frequencies, Chi Square values, and p-value for Competitiveness of Universities

	SD	D	U	A	SA
	%	%	%	%	%
Due to advanced technologies in the universities, institutions have become innovative in their services offered	9.4	9.4	0.0	73.6	7.5
Universities are capable of tailoring their courses to suit different educational need of the learners	9.4	7.5	1.9	73.6	7.5
Use of technology by higher learning institutions has introduced new communication methods useful to encourage tertiary learning	11.3	13.2	7.5	47.2	20.8
Technology has enabled distant learners to register online courses and programs	5.7	15.1	3.8	62.3	13.2
Universities use satisfactory quality teaching and recognized degree with acceptable quality in order to achieve overall cost leadership	3.8	7.5	11.3	66.0	11.3
Universities offers subsidized fee which attract more students to enroll courses	1.9	18.9	1.9	67.9	9.4
Universities offer school based courses and programs which attract more part-timers to enroll for courses	7.5	9.4	3.8	64.2	15.1

Most of the respondents cited that universities in Nakuru Town, Kenya are capable of tailoring their courses to suit different educational need of the learners (agree=73.6%), with 7.5% of the respondents strongly citing the same. However, 7.5% and 9.4% of the respondents disagreed and strongly disagreed, respectively indicating that they felt that universities in Nakuru Town, Kenya are incapable of tailoring their courses to suit different educational need of the learners. A few respondents tended to be undecided on the matter (1.9%).

The use of technology by higher learning institutions was perceived to have introduced new communication methods useful to encourage tertiary learning by almost half of the respondents (47.2). This perception was also strongly cited by 20.8% of the respondents who chose "strongly agreed". However, 13.2% (disagree) and 11.3% (strongly disagree) of the respondents cited that use of technology by higher learning institutions has not introduced new communication methods useful to encourage tertiary learning. Some respondents (7.5%) were undecided on the matter.

Technology in universities in Nakuru Town, Kenya has enabled distant learners to register online courses and programs as perceived by 62.3% (agree) and strongly perceived by 13.2% (strongly agree) of the respondents. On the other hand, technology in universities in Nakuru Town,

Kenya was perceived not to have enabled distant learners to register online courses and programs by 15.1% (disagree) and 5.7% (strongly disagree) of the respondents. A few respondents tended to be undecided on the matter (3.8%). The study found that universities in Nakuru Town, Kenya use satisfactory quality teaching and recognized degree with acceptable quality in order to achieve overall cost leadership as cited by 66.0% of the respondents. Further, 11.3% of the respondents were strongly of the same view. However, some respondents tended to disagree (7.5%) and strongly disagree (3.8%) with the statement as well as be undecided (11.3%).
It was cited that the universities in Nakuru Town, Kenya offer subsidized fee which attract more students to enroll for courses by 67.9% of the respondents. Similar views were strongly made by an additional 9.4% who chose "strongly agree". On the other hand, 18.9% and 1.9% of the respondents tended to disagree and strongly disagree on the same. A few respondents tended to be undecided on the matter (1.9%). Most of the study respondents tended to agree (64.2%) that universities in Nakuru Town, Kenya offer school based courses and programs which attract more part-timers to enroll for courses. Some respondents tended to strongly agree on the same (15.1%). However, 9.4% and 7.5% of the respondents tended to disagree and strongly disagree on the same. A few respondents tended to be undecided on the matter (3.8%).

Correlational Analysis

		Online Teaching Platforms	Smart Boards	Competitiveness
Online Teaching Platforms	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	53		
Smart Boards	Pearson Correlation	.503**	1	
	Sig. (2-tailed)	.000		
	N	53	53	
Competitiveness	Pearson Correlation	.769**	.823**	1
	Sig. (2-tailed)	.000	.000	
	N	53	53	53

The study also established that online teaching platforms and management information systems (r=0.769; p=0.000) had a weak positive association which was found to be significant (p<0.05). In addition smart boards and competitiveness (r=0.823; p=0.000) were found to have strong significant associations which were significant. Therefore, increasing the online teaching platforms increases the competitiveness of the universities in Nakuru Town, Kenya.

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.691	.341		2.027	.048
1 Online Teaching Platforms	.265	.051	.472	5.227	.000
Smart boards	.256	.048	.472	5.295	.000

a. Dependent Variable: Competitiveness

The regression coefficients shows that online teaching and smart boards had positive regression coefficients of 0.265 and 0.257 respectively while the constant was at 0.691. This led to the following regression equation. $Y=0.691 + 0.265X_1 + 0.256X_2 + 0.12938$ where Y, X1, and X2, refers to competitiveness of the universities in Nakuru, online teaching and smart boards respectively.

All the regression coefficients for the independent variables were found to be positive that indicated that the individual independent variables had positive influence on the dependent variable. This implied that increase in online teaching and management information would also lead to an increase in the competitiveness of the universities in Nakuru.

The online teaching had a regression coefficient of 0.265 which indicated a unit increase in online teaching would lead to a 0.265 increase in competitiveness of the universities in Nakuru with the other variables kept constant. Similarly, use of smart boards had a regression coefficient of 0.256 which indicated that a unit increase in smart boards usage would lead to a 0.256 increase in competitiveness of the universities in Nakuru with the other variables kept constant. The hypothesis testing was undertaken through the t statistics and a statistically significant relationship is present if p<0.05 as hypothesis was tested at 5% level of significance.

Three hypothesis were tested that were in line with the set research objectives. The first hypothesis stated online teaching platform has no significant influence on competitiveness of universities in Nakuru Town, Kenya. In respect to this hypothesis, the study noted that the regression coefficient of online teaching was 0.265 and t value of 5.227.

The achieved p value was 0.000 and since p value < 0.05 then the study concluded that there was a statistically significant relationship between online teaching platform and competitiveness of universities in Nakuru. This led to the rejection of the null hypothesis.

The second hypothesis was stated Smart boards do not have a statistically significant influence on competitiveness universities in Nakuru Town, Kenya. In respect to this hypothesis, the study noted that the regression coefficient of smart boards was 0.256 and t value of 5.295. The achieved p value was 0.000 and since p value < 0.05 then the study concluded that there was a statistically significant relationship between smart boards and competitiveness of universities in Nakuru. This led to the rejection of the null hypothesis.

V. CONCLUSION & RECOMMENDATION

A. Conclusion

The study concluded that online teaching had a positive and significant relationship with the competitiveness of the universities. This was due to a positive correlation and regression coefficients. The study concluded that management information systems had a positive and significant relationship with the competitiveness of the universities. This was due to a positive correlation and regression coefficients. The study concluded that smart boards had a positive and significant relationship with the competitiveness of the universities. This was due to a positive correlation and regression coefficients.

B. Recommendation

The study recommended that online teaching platforms be

considered as items for ensuring competitiveness of universities in Nakuru. This will ensure that students in remote areas socially or geographically and those who require individualized support have learning schedules that are more suitable to them as well as separate from other learners.

The study recommended that smart boards be considered as items for ensuring competitiveness of universities in Nakuru. The smart boards capture the student's academic interest through the use of interactive instruction with hands on activities thus increase the efficiency of learning at any location. The smart board's ability to record information for future use should be improved as it acts as a reference for students which might attract a huge clientele and make the universities competitive

The study recommended that a clearly defined e-learning policy be formulated to act as a guideline for universities in the utilization of technology in universities. This will ensure that there is a systematic adoption of e-learning in the country.

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