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Impact of mass media on the political participation among Kenyans: a case study of Nairobi youth

By

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Abstract

The past decade has witnessed fundamental changes in the Kenyan mass media environment. Contemporary media technologies and format innovations have created new ways of communicating and reaching audiences. New actors, such as talk show hosts and tabloid reporters, have entered the political communications environment, altering the rules by which journalists, leaders, and citizens negotiate the public sphere. The nature of the political media product has changed, becoming almost inextricably infused with entertainment content. Furthermore, with the convergence of electronic media in the recent past, and with technologies such as the internet have rendered print communication electronic, as traditional news organizations establish online counterparts to their newspapers and magazines. Further, the substance, form, and style of electronic communication have been altered radically. New-style electronic formats, such as internet discussion groups and chat rooms have created new public spaces and provided for unprecedented opportunities for political discourse. It is clear that the transformation of the Kenyan mass media system has important implications for democratic citizenship, especially as audiences' relationships to mass communication have been influenced significantly. Communication plays a central role in stimulating and enabling political participation on a variety of levels for many people. Information and Communication Technologies (ICTs) have enhanced citizen interactions with their governments where the internet and web have fostered greater public deliberation and consensus building (Noam, 2001; Margolis & Resnick, 2000; Davis, 1999) These technologies have been described as possessing the potential to revitalize the public participation by enabling citizens to gain unprecedented access to government information and allowing them to interact with public officials in decision-making at the local, state, and international levels (Horrihan, 2004; Regan, 2002), while at the same time endangering diverse public debate by facilitating online interaction limited to groups of likeminded individuals (Galston, 2002; Sunstein, 2001).

Keywords; communication, Contemporary media technologies, Communication, internet

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Introduction

Okwengu (2010) defines mass media as a channel through which messages are passed on to the public. The intention of passing this message is always to inform, persuade, or provoke response among the public. One of the primary characteristics of the mass media is the interactivity that communications technologies facilitate among citizens, public officials, and media personnel. Rather than merely being the passive recipients of political information, it is now possible for citizens to make their political presence and opinions known, and to play a more visible role in political events. For example, televised news chat programs regularly feature citizen call-ins, news magazines present instantaneous online polls of citizens' opinions about political events and issues, and average people ask questions of candidates during televised debates. Political elites keep abreast of talk radio discussions as a gauge of public opinion. Further, record numbers of citizens are joining political organizations other than parties, especially those associated with particular issues. This involvement has been aided by media publicity and interactive communication forums which allow people to express their opinions, ask for and obtain information quickly, and receive instructions about how to take action (Schudson, 1998).

The Kenyan Mass Media

Kenya has a plural, sophisticated and robust mass media and communication sector that serve the various competing political, social, economic, cultural and technological needs of diverse interest groups (BBCWST, 2008). Mbeke (2009) notes that the sector has grown rapidly in the past 15 years because of a combination of factors including political and economic liberalization; and Kenya's strategic location as a regional and international economic and communication hub. Before 1992, the media scene was small, urban based and less independent owing to repressive media laws and regulation. Today, the media especially radio and television, reaches all urban centers and almost all rural communities. The media are relatively free despite the overbearing government tendencies towards it.

The broadcasting sub-sector is diverse, dynamic and competitive with substantial reach (BBCWST, 2008). There are about 17 TV and 70 radio stations in Kenya (Steadman Group, 2010). Radio is the number one source of information reaching almost 90 percent of the entire population followed by television reaching about 40 percent and newspapers (30 percent). There are about 7.5 million radio sets (1.9 million in urban and 5.6 in rural areas) and 3.2 million TV sets in Kenya (1.4 million in urban and 1.8 in rural areas) in the country. There are about 16.7 radio listeners across the country with 12.4 million in rural and 4.4 million in towns (Steadman Group, 2010). Interesting developments in the broadcasting sector include the proliferation of FM stations broadcasting in over 22 ethnic languages out of 42 (CCK, 2010). The FM stations broadcasting in ethnic languages command about 30 percent of the market share today. Unfortunately, low professionalism characterizes most of these FM stations because they employ untrained and less experienced journalists. Satellite broadcasting is also thriving particularly among the upper and middle class in urban areas (Howard, 2008). Although the print media has a history of relative independence, it remains an urban phenomenon in Kenya (BBCWST, 2008). Kenya has over 8 daily newspapers and over 10 weekly newspapers. The dominant newspapers are the Standard with a daily circulation of 80,000-110,000; and Nation newspapers with a circulation of 100,000-120,000 (Mbeke and Mshindi, 2008).

A recent development is the proliferation of new media with Kenya boasting of 10.6 million mobile phone owners and 3.2 million internet users. There are over 600 active blogs in Kenya. Safaricom, Kenya's number one mobile operator commands 70 percent of the market had over 8

million subscribers (Business Week, August 2009) with a sales growth of about 36 percent per year.

There is a tendency towards concentration of media with few politically connected individuals and business organizations owning most of the media (KNCHR, 2007, Mbeke and Mshindi, 2008). Kenya Broadcasting Corporation, the oldest and only public broadcaster, has the largest network of TV and radio stations across the country. Although it operates as a semi-autonomous state agency modeled along the lines of British Broadcasting Corporation (BBC), KBC is strictly controlled and managed by the government of Kenya (Makali, 2004). KBC radio service, broadcasting in over 21 ethnic languages, is the only network in Kenya with the capacity to reach all audiences across the country. It also operates KBC TV (channel 1), pay TV (channel 2) and Metro TV (channel 31). KBC largely serves the interest of the government and rarely gives equal opportunity to members of the opposition contrary to the Inter-Party Parliamentary Group recommendations (1997) that it serves all parties equally (GoK, 2007).

Royal Media Services, owned by media magnate S.K. Macharia, is the second largest media house in Kenya. It operates a newspaper The Citizen; Citizen TV which has a national reach, and several radio stations broadcasting in ethnic languages including Kikuyu (Inooro), Luo (Ramogi), Kamba (Musyi), Luhya (Mulembe) etc. While it is aligned with the ODM, it allows its ethnic channels to identify with the interests of the local political elites and parties in each area.

The Nation Media Group (NMG) is the largest media network in Kenya with interests in newspapers, magazines, TV and radio. It operates the Daily Nation, Sunday Nation, the Nairobi Metro, the Business Daily, the East African newspapers as well as True Love, Drum, Tourist Guide, the Business Directory among other magazines (BBC Media Monitoring, 2007). MNG runs the NTV as well as Easy FM (1999) stations both with national reach. NMG is listed on the Nairobi Stock Exchange (NSE) with the Aga Khan as the key shareholder.

The Standard Group (SG) runs the popular Kenya TV Network, Kenya's first private TV station (1989) and the East African Standard Newspapers, the oldest newspapers having started in 1902. The SG is listed on the NSE with Baraza Limited, a company closely associated with the former President Daniel arap Moi and his close aide Joshua Kulei as the key shareholders.

Regional Reach, a company owned by media professional, Rose Kimotho, operates the K24 TV station and the popular Kameme FM which broadcasts in Kikuyu language, as well as the GTV satellite network. Patric Quarcoo owns Kiss FM, Kenya's number one radio for the youth and Nairobi Star, a daily newspaper. Industrialist Chris Kirubi owns Capital Broadcasting Corporation (CBC) that runs CBC TV and Capital FM. Other media include the People (politician Kenneth Matiba), the Kenya Times (formerly owned by KANU), STV formerly owned by professional journalist Hilary Ngweno. Kenya also has a strong faith-based broadcasting media including Hope FM, Radio Waumini owned by the Catholic Church; and Family TV and radio FM station owned by Leo Slingerland.

A number of international news agencies and organizations operate from Nairobi, Kenya. These include the BBC, VOA, DW, Radio France, Radio China, Al Jazeera and CNN. While the press covers mainly politics and economic issues, the broadcasting stations in Kenya are characterized by heavy music and light entertainment programming laced with interactive talk shows on politics and current affairs.

Problem Statement

The interaction between media and political participation is complicated. Media can encourage or discourage participation by drawing attention to political leaders, events, and issues. Electronic media, in particular, not only allow people to monitor politics but also provide them with options for active engagement. Center for Democracy and Governance (CDC) (1999) writes that access to information is essential to the health of democracy for at least two reasons. First, it ensures that citizens make responsible, informed choices rather than acting out of ignorance or misinformation. Second, information serves a “checking function” by ensuring that elected representatives uphold their oaths of office and carry out the wishes of those who elected them.

Kenyans rely on newspapers, television, radio, and online media to stay informed about politics. Media connect people to political events, such as election campaigns and rallies which they may have limited direct, personal contact. New information technologies and digital tools, such as websites, blogs, e-mail lists, and social network sites like Facebook and twitter are used to organize people online. These tools are used to spread information, recruit participants, and provide logistical information about events. People who are geographically dispersed share stories and strategies that provide incentives for engagement.

However, scholars disagree about the effects of mass media on political participation among the public. Some argue that the media serve the public by providing information that stimulates political interest, furthers information gathering, and encourages participation. The result is a “virtuous circle” that promotes political engagement. For example, during the 2007 presidential elections in Kenya; the media stimulated public interest with its campaign coverage that incorporated voters’ voices through innovated new media, such as blogs and candidates’ live debates.

On the other hand, other scholars contend that the media’s scandal-ridden and negative coverage of government and politics creates a “spiral of cynicism” by generating public distrust, discouraging interest, eroding attention to the news, and ultimately hindering participation. They argue that the media, in some instances, may have no effect on participation. People may not pay attention to political media or take media messages seriously. They assess politics on the basis of their own personal experiences or those of their families and friends. The decision to participate is related to their membership in groups and social networks, being contacted by a political party or interest group, or a sense of civic duty and efficacy. Thus some individuals’ participation or inaction is influenced by their personal realities rather than mediated realities.

Therefore, the goal of this paper is to establish the impact of mass media on political participation among Kenyans. It will assess the extent to which citizen attitudes and orientations are shaped politically by the mass media. The second various mass media to be studied include; newspapers, radio TV and electronic media. In this paper I will use the Nairobi youths as a case study in the relationship between mass media and political attitudes and participation.

Objectives of the Study

- i. To find out the various types of mass media Kenyans use to have access to political information

- ii. To find out the extent of media coverage of politics in Kenya
- iii. To establish the various tools used by the media in providing for public participation in politics.
- iv. To find out the extent to which Kenyans participate in politics as a result of mass media influence.

Research Questions

- i. What are the various types of mass media Kenyans use to have access to political information?
- ii. To what extent do the media cover of politics in Kenya?
- iii. What are the various tools used by the media in providing for public participation in politics?
- iv. To what extent do Kenyans participate in politics as a result of mass media influence?

Significance of the Study

Public Participation in Politics

The main purpose of this study is to find out how the Kenyan media impacts political participation among Kenyans a case study of Nairobi youths. This will lead to an exploration into role of the media in politics in matters such as freedom of expression, right to information, media censorship, national security, and conflict resolution all in the context of press freedom. The research will also be able to discuss several specific cases relating to the Kenyan politics. It will determine if the media is purely a tool of propaganda by politicians or innocently performing their duty.

Media Stakeholders

The outcome of this research will therefore explain the various facets of politics and media participation and consequences to the public, prior to and through past electioneering period. This research will also inform stakeholders who wish to have basic knowledge on using the media in politics intervention.

Academics and Research

Lastly, an analytical perspective that this research seeks to share will add to the body of knowledge in setting precedence on who is the credible source of information in politics and the impact the media has on the public. This will especially, be useful to law makers who will be guided on what clauses to include or remove in the constitutional clause that permits press freedom and media licensing.

1.6 Scope of the Study

The study will include an in-depth look into the role of the media in communication and information gathering and dissemination as well as its role in politics and public participation.

The study is a case study of Nairobi County. Nairobi County hosts the capital city of Kenya and occupies an area of 696 km². It is divided into eight administrative divisions namely; Embakasi, Makadara, Pumwani, Central, Kasarani, Westlands, Kibera and Dagoreti.

Limitations of the Study

The researcher is bound to get differing opinions on the role of media in the Kenyan politics, hence putting aside preconceptions, prejudices, emotions and analysis will be a challenge.

Due to logistical, cost and time constraints, it was not possible for the researcher to include all youths in Nairobi. Therefore the researcher only will use a sample size of 100 youths from Nairobi and thereby generalize the research findings to all Kenyans.

Literature review and theoretical framework

Introduction

McCombs, (2009) notes that the mass media's power to set a nation's agenda by focusing public attention on a few key public issues is an immense and well documented influence. Not only do people acquire factual information about public affairs from the news media, readers and viewers also learn how much importance to attach to a topic on the basis of the emphasis placed on it in the news. Newspapers provide a host of cues about the salience of the topics in the daily news – lead story on page one, other front page display, large headlines, etc. Television news also offers numerous cues about salience – the opening story on the newscast, length of time devoted to the story, etc. These cues repeated day after day effectively communicate the importance of each topic. In other words, the news media can set the agenda for the public's attention to that small group of issues around which public opinion forms.

McCombs (2009) further notes that the agenda-setting influence of the mass media is not only limited to focusing public attention on a particular topic. The media also influence the next step in the communication process, the people's understanding and perspective on the topics in the news. For example the public images held by the public of political candidates in a general election and other public figures are the most obvious examples of attribute agenda-setting by the news media. During the 2007 general election in Kenya, most voters held the descriptions of the presidential candidates as presented by the media.

However, because media influence is an individual psychological trait, the degree of need for orientation/media influence varies greatly from one individual to another. For some individuals in any situation, there is a high need for orientation. For other individuals, there is little or no need for orientation at all. They just aren't interested. Need for influence is defined by two components: relevance and uncertainty. Relevance is the initial defining condition that determines the level of need for orientation for each individual. If a topic is perceived as irrelevant – or very low in relevance – then the need for orientation is low. Individuals in this situation pay little or no attention to news media reports and, at most, demonstrate weak agenda-setting effects.

For individuals among whom the relevance of a topic is high, their degree of uncertainty about the topic determines the level of need for orientation. If this uncertainty is low, that is, they feel that they basically understand the topic, and then the need for orientation is moderate. These individuals – for whom a situation has high relevance and low uncertainty – will monitor the media for new developments and perhaps occasionally dip into a bit of additional background information. But they are not likely to be avid consumers of news reports about the topic. Agenda-setting effects among this group are moderate.

Finally, among individuals for whom both the relevance and their uncertainty about a situation are high, need for orientation is high. These individuals typically are avid consumers of the news, and strong agenda-setting effects typically are found among these individuals.

Types of Mass Media in Kenya

Print Media

The print media can be divided into four sectors: the regular daily newspapers, the magazines, the regional newspapers, and the printed sheets that also seek to pass for newspapers in the urban centre streets. Kenya has four major daily national newspapers in English and one in Kiswahili all published in Nairobi with a combined daily circulation of almost 400,000. Relative to other nations, even those of Africa, the history of the press in Kenya is rather recent. Literacy started in Kenya following the arrival of Protestant missionaries nearly a century and a half ago (Church of the Province of Kenya). The missionaries embarked on teaching new converts how to read and write primarily so that the new converts could read biblical literature for themselves. The initial publications carried religious materials (Collender, 2010).

The oldest mass circulating newspaper is *The Standard* founded in 1902 by a Parsee migrant, A. M. Jeevanjee. Another major mainstream newspaper in Kenya is *Daily Nation*. Prior to the founding of the *Nation* published by Nation Media Group (NMG) Kenya had a very vibrant nationalist press. The *Nation*, with a circulation of 184,000, is Kenya's most widely circulated newspaper today according to Lukalo and Wanyeki (2000). It was first registered in 1959 by Michael Curtis and Charles Hayes both newspapermen in London and Nairobi, respectively. Besides the English language *Nation* the NMG also publishes a Kiswahili edition *Taifa Leo*. NMG also publishes *the EastAfrican*, a conservatively designed weekly newspaper focusing on economic news in East Africa. *The People*, owned by Kenneth Matiba, started as a weekly, but turned daily with a Sunday edition in December 1998. Initially founded to serve as the voice of the opposition politics, and to report materials that *Daily Nation* and the *Standard* feared to touch. An emerging trend in the Kenya media scene is the publication of what, in Kenyan terminology, is called the gutter press. The sheets are sold on news-stands and often on street corners for less than half the price of the daily newspapers. They are poorly written, poorly edited, poorly laid out, poorly printed, and contain poor pictures. Generally they have no fixed address, no known publisher, and tend to focus on rumor sometimes making very spectacular claims. They have no clear frequency, will appear out of the blue, make some spectacular claim that regards either sexual or corruption scandal involving a prominent personality, then disappear. They may only occasionally write on current affairs.

Broadcast Media

For a long time the Kenya Broadcasting Corporation (KBC) dominated Kenya's electronic media scene. Formerly the Voice of Kenya, the station, founded in 1927, runs a nation-wide television service, three radio channels broadcasting throughout the country, in two English and one in Kiswahili, and 16 regional ethnic language stations (Abuoga & Mutere, 1988). KBC TV's news presentation format was always predictable especially in the last decade and a half beginning with the 1982 attempted coup. The lead story was on the president's activities including Sunday church attendance. The radios were not any different either. However, this reporting style was nominally challenged by the launching of other stations. Other stations launched as privately owned include; Citizen TV, NTV, Family, KTN, Kiss TV, K24 and GBS.

Television broadcasting has really made an impact in Kenya's countryside. This has been enhanced by reduction in the cost of a television set and by the availability of electricity in rural homes due to the rural electrification programme. But more Kenyans have greater access to radio

receivers. Transistor radios today are cheap and available at nearly every street corner from hawkers. Abuoga and Mutere (1988) and Mytton (1983) suggest several reasons that make the medium popular. These include the low rate of functional literacy, the poor economy, the poor communication network, transport system and the people's lifestyles.

The government knows only too well the strength of the radio and used it for political expediency. The government is familiar with the daunting task anybody who wanted to reach the entire country has. Only radio can reach all these people. Unconcerned with the language and distance barrier of the newspapers, the radio reaches the Maasai in his manyatta, the Somali herdsman in the outback in the north and the expatriate in his air-conditioned Nairobi home, all at once (Collender, 2010).

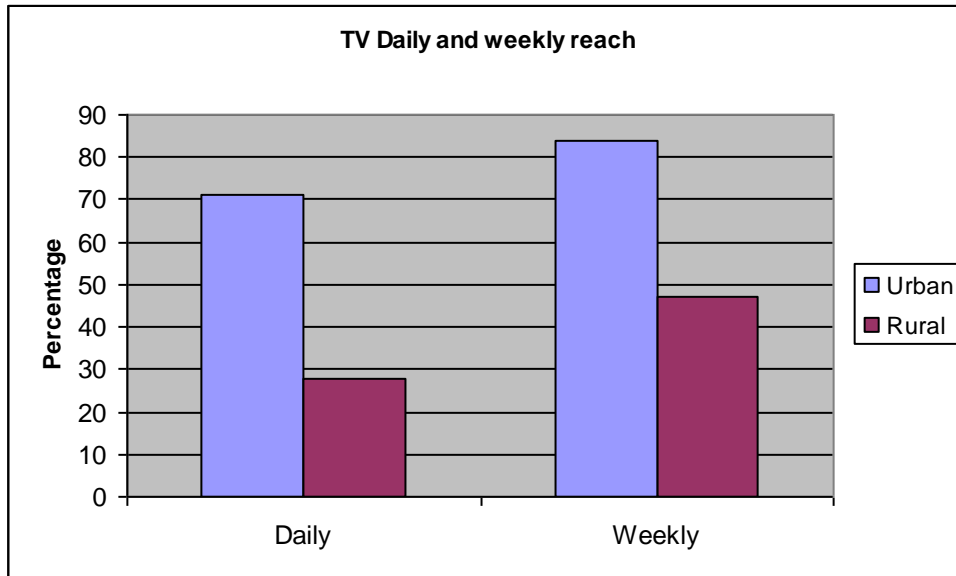
Electronic News Media

All the major news houses are available on the internet. The *Daily Nation* and the *Standard* newspapers, and other mainstream newspaper web pages are updated daily. The *Daily Nation* web-site has searchable back editions going to 2000. There are now over 5 million Kenyans on the internet with over 3 million of these being active content consumers on the mobile web. Social media usage is prominent amongst Kenyan internet users with Facebook and YouTube being amongst the top visited web services in Kenya. Furthermore as of December 2010, Facebook had about 1 million subscribers in Kenya. Amongst them include organizations that have taken or are taking the leap to move processes online (Hyder, 2010). The various social networks used to disseminate information and encourage audience participation include Twitter, Facebook, Google+ and various media websites and blogs.

Media influence and Audience behavior

Kenyan audiences are fragmented along the various media channels. Over 39 per cent of Kenyans watch TV, over 90 per cent listen to radio, 23 per cent read newspapers. Nearly 3 million use Internet services while over 14 million use mobile phones. There are more TV viewers in urban centers than rural areas (Oriare, Orlale and Ugangu, 2010).

Figure 1: Daily and weekly TV reach in Kenya



Source: Steadman Group (2008)

Urban areas have wider TV coverage because access to electricity. Private TV stations such as NTV, KTN and Citizen TV were initially only allowed to broadcast to a restricted area around urban centers, but this is changing.

Media Tools in Politics

Televised Live Shows

Kenyans rely on newspapers, television, radio, and online media to stay informed about politics. Media connect people to political events, such as election campaigns and rallies to which they may have limited direct, personal contact. People also can actively take part in politics through media. Television and radio call-in talk shows and Internet chat rooms accommodate political discussion between the public, political activists, government leaders, and the press. Talk-shows not only encourage listeners to sound off on air but also urge them to contact government officials, circulate political newsletters in their towns, and hold rallies and bake sales to raise funds for conservative causes.

Televised town meetings allow the public to ask questions directly of politicians and journalists. All media stations in Kenya are a day of news about politics and elections campaigns, culminating in a political debate with then KTN Louis Otieno as the Moderator titled “The Big Debate” in which candidates of the various political parties were invited for question and answer. During election campaigns, televised presidential debates that allowed voters, rather than journalists, to ask questions drew the largest audiences.

Talk Radio

If there has been one communications format that has become emblematic of the new media, it is talk radio. Many politicians are invited for a talk over the Radio in which they state their political mandates as well as campaigning to the masses. This also allows the audiences to ask questions live which are answered by the politicians promptly. Talk radio has a political platform.

The Internet

Increasingly, the internet has become a tool for political communications as well. On the net you could gain political info, express political opinion, and mobilize other voters and political leaders. You could also make political donations. In this year's presidential race, candidates have raised literally millions of dollars online. The web has become an electronic town hall. In a brief time, the web has grown into a major player in the new media.

Effects of Mass Media on Political Participation

Okwengu (2009) writes that Kenya witnessed post election violence in a magnitude that shocked many who depend on Kenya for tourism, education, export and import of goods and services etc. Above all, the lives lost and property destroyed has left many baffled to date. In once considered to be the most politically secure society, the aftermath of a blamable election in Kenya did more harm than just a fight between ethnic groups, media and public institutions that hold different political stands. This ignited the long hidden ethnic tensions, resulting in violence, (Amutabi, 2009). Fundamentally, the human process of collecting information, analyzing it, making decisions, and acting upon these decisions, based on media exposure, remains a dynamic complex subject of study and comprehension (Kiraitu, 1995). The 24/7 news live coverage has kept the public informed of events as they unfold (Livingstone & Steven 1997).

The following are ways in which the media has influence on public participation in politics:

Media and Political Campaigns

In a democratic electioneering process, rivaling politicians must enjoy their freedom of media campaign exposure as they try to lure voters. Failure to exercising this freedom then their ideologies will not be heard. In some cases undemocratic the ruling political can inhibit directly or indirectly the avenues for this free expression by rival parties (Rutherford, 1994). The media also act as a gatekeeper that holds both the government and politicians accountable to fulfill their promises to the public. Investigative journalism complements the questions in the society that the voters might need in order to make sound election judgments (Ibid: 129). A comparison of the governments practical work verses their manifestation sometimes forms an agenda of the media. This informs the voter on how to vote and whom to vote for.

The Media in Electioneering Process

Elections tend to be events that citizens look forward to most of the time. Some look forward to this time to have change, or to have politicians running to support their communities with free gifts, or change of regime (Leo, 1984: 93). Prior to the 2007 Post Election Violence in Kenya, The Electoral Commission of Kenya was to live televise the presidential results at KICC but this turned chaotic and the wrangle groups publicly exchange bitter words transmitted all over the country on all TV stations. This fuelled the nation and violence erupted in all most all parts on the country.

The media therefore informs the public of illegal activities and corruption, violation of human rights and rules of the election process. In the event the media works for the politicians, then they cannot expose these mishaps. The media therefore must be familiar with election process, and be able to anticipate any possible mishaps as well as mitigate them by exposing these activities to public criticism.

Role of the Media in Persuasion and Influencing Social Behavior

As new forms of media evolve, new questions are posed as to their effect on social behavior (Meyrowitz 1985: 93). Kenya's media fraternity has not only seen growth, but it has also gone through growth to an extent that now Kenya enjoys press freedom. With the evolution various forms of media have come up and licensing has been made easier. This is to say; virtually every Kenyan can access at least one form of the media. The social behavior has on the other hand been modified with the western culture, pop culture, and universal human rights being known by this population. In other words, if the media does have an influence on its audience, then the Kenyan audience is not immune. By exposing the governments' failures to this public, the media voluntarily or involuntarily causes the public to revolt or oppose the government on account of their failure.

To show this causal-effect relation of the media and its audience, Chouliaraki, (2006) explores the nature of the relationship between television images and those affected by conflict. She says, news coverage of conflict or war often appeals to emotions hence the questions such as what do we do when we receive media words or images. Do we put off the television set, cry, get angered, complain or even provoke war and genocide when exposed to the media? These questions tackle the role that media exposure has on its audiences. In addition, Chouliaraki, (2006) discusses the role of media contents and notes that the media makes spectators feel that they operate generously on their own and are endowed with spontaneous civic or humanitarian feelings that makes them react. In other words the media when used unethically can be used to create an uprising against the government or various authorities.

Media's Role in Influencing Peace or War

In order for news to have an impulsive response that causes the audience to react, there has to be vivid stories of those suffering or injustice brought to the sitting rooms of the audience (Turkle 1997). These stories become the back bone and origin of conflict, a war of words whose play ground is the media and its supporters or disapprovers are the public. Notably, for these stories to have an impact they have to explicitly appeal to spectators, steer up reaction, bringing up the questions of how they can respond to alleviate the injustice or suffering by merely provoking audiences to rise and stop the conflict (Chouliaraki 2006).

The matchless nature of media coverage of conflict makes all people caught up in conflict has one thing in common; an element or wish for change and often the call for action (Chouliaraki 2006). This is especially true since conflict news normally leads to diverse visualization of those caught up in conflict. This gives rise to a blend and handy domination of various emotional feelings during conflict. This implies that viewers are led to react, possibly through violent actions. Also The amount of emotions that the media arouses and influences audiences to act has also been termed as politics. Hence the role of media coverage is not always out of good heart, but a political means to arrive at vested interest (Chouliaraki, 2006). In other words, the media can be used to fuel politics by the government. When a particular media house doesn't support the politics of the government then the government is likely to have different political interests with them. This automatically sets a ground of animosity unless sanity rules.

The media therefore optimizes on reporting on the any infringement on their freedom to share information, and possible effects this would have on their audience. This they do in order to influence their audiences. This unique feature gives rise to an exemplary manifestation of media

politics that appeal for sympathy from their audiences and mostly win their hearts ((Chouliaraki, 2006). The media therefore uses any aggression toward the media as an act that oppose realization of democracy. Of course most citizens would reject to any threat on democracy to thrive hence, these messages to gang up against the government are mostly fruitful.

The Role of the Media in Creation of Unintended Reaction

This is a different effect from the majority of the response. It occurs when the media's attempt to provoke their audience to rally with them, fails to take place. Instead their audience chooses to be indifferent and not to be part of a conflict (Turkle & Sherry 1997). In such cases the different parties using the media as a fighting ground fail since there none or minimum effect of their messages on their audience. Also noted is a tendency on the reaction of media audiences or the role that the media has on its audience's reaction. This, he refers to the boredom of the audience of receiving repeated war or conflict or dreadful events from the media to an extent that they become indifferent to the messages. Eventually the audience is left unmoved, unshaken and non responsive to the media messages In this case if the media is preaching hate messages to perpetuate violence, the audience remains unmoved and the plot to create reaction or public participation is thwarted (Turkle 1997).

Theoretical Framework

Limited-Effects Theory

The limited-effects theory argues that because people generally choose what to watch or read based on what they already believe, media exerts a negligible influence. This theory originated and was tested in the 1940s and 1950s. Studies that examined the ability of media to influence voting found that well-informed people relied more on personal experience, prior knowledge, and their own reasoning. However, media "experts" more likely swayed those who were less informed. Critics point to two problems with this perspective. First, they claim that limited-effects theory ignores the media's role in framing and limiting the discussion and debate of issues. How media frames the debate and what questions members of the media ask change the outcome of the discussion and the possible conclusions people may draw.

Class-Dominant Theory

The Class-Dominant Theory argues that the media reflects and projects the view of minority elite, which controls it. Those people who own and control the corporations that produce media comprise these elite. Their concern is that when ownership is restricted, a few people then have the ability to manipulate what people can see or hear. For example, owners can easily avoid or silence stories that expose unethical corporate behavior or hold corporations responsible for their actions. The issue of sponsorship adds to this problem. Advertising dollars fund most media. Networks aim programming at the largest possible audience because the broader the appeal, the greater the potential purchasing audience and the easier selling air time to advertisers becomes. Thus, news organizations may shy away from negative stories about corporations (especially parent corporations) that finance large advertising campaigns in their newspaper or on their stations.

Critics of this theory counter these arguments by saying that local control of news media largely lies beyond the reach of large corporate offices elsewhere, and that the quality of news depends upon good journalists. They contend that those less powerful and not in control of media have often received full media coverage and subsequent support.

Culturalist Theory

The Culturalist theory, developed in the 1980s and 1990s, claims that people interact with media to create their own meanings out of the images and messages they receive. This theory sees audiences as playing an active rather than passive role in relation to mass media. Theorists emphasize that audiences choose what to watch among a wide range of options, choose how much to watch, and may choose the mute button or the VCR remote over the programming selected by the network or cable station. Studies of mass media done by sociologists' parallel text-reading, and interpretation research completed by linguists, (people who study language). Both groups of researchers find that when people approach material, whether written text or media images and messages, they interpret that material based on their own knowledge and experience. Thus, when researchers ask different groups to explain the meaning of a particular song or video, the groups produce widely divergent interpretations based on age, gender, race, ethnicity, and religious background. Therefore, Culturalist theorists claim that, while a few elite in large corporations may exert significant control over what information media produces and distributes personal perspective plays a more powerful role in how the audience members interpret those messages.

Conclusion

Having looked at this literature, I believe that the media can be used positively or negatively on public political participation. The Kenyan situation is a good example of this scenario; especially on how exposure to the media can shape the audiences decisions, reaction and impact politics. The media moreover intentionally or unintentionally creates identities and offers avenues for different views to be showcased. The media has a duty to expose the politicians, their parties, and manifestos to the public in order for the public to make sound judgments on which candidate to vote for. In other words, failure to expose or bias by the media to give a true representation of the political parties, can influence undemocratic voting patterns. Therefore the media can be used as positive avenue for exchange of political ideologies and visions for the country.

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Copyright Effects on Access and Use of Information in Kenyan University Libraries
By

Jotham Milimo Wasike*

Abstract

The creation of an acceptable copyright balance between owners and users of information materials has brought a discourse on access and use of information from the global to the local sphere. This debate is anchored on the increasing demands by consumers of copyrighted products for free access and use of information resources. It is argued that copyright law has no space in the world of freedom and right to information access, while owners advocate for stiff and stringent copyright protection and implementation. It is for this reason that this study sought to investigate the effects of copyright on access and use of information in university libraries in Kenya, with a view of proposing ways and means of maximizing information use.

Key words; information, copyright protection, resources,

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Introduction

Copyright is a branch of intellectual property that results from an intellectual activity covering literary, audio-visual, computer programs, musical compositions, artistic and related works (Lessig, 2001). It allows access and limits use of intellectual works which could have otherwise been unrestrictedly accessed and used in as many ways as the human mind could conceive (Wesley, 2007). It is a sole right granted to the author to copy, produce, distribute, perform, translate, adapt or arrange a work in any material form and prevent use of the material without fair reward (Nimmer, 2001). In effect, there are really two groups in the copyright phenomenon: creators who have legal rights under the copyright law and users who have legal rights through exceptions and limitations to creators' rights (Airyae, 2006).

Background to the Problem

Information is critical in intellectual growth of users at the university (Britz, 2004). It is considered a valuable resource that can be owned, exchanged, accessed and used for education purposes. According to Okiy (2002), information is power and an appropriate information provision empowers people and nations to promote informed decision making. Due to its value, information is highly regulated through copyright bilateral and multilateral treaties and agreements. However, the application of copyright laws in access and use of information is highly contested by university library users. This is because copyright laws have not been universally accepted as there are unmet needs in the balancing act (Olaka, 2010). This is fuelled by owners' argument that current exceptions and limitations given to users to access and use information are far more than enough; therefore they should be reduced for them to be compensated appropriately. However, users think that copyright library privileges are narrowly construed to favour owners; therefore they should be expanded or done away with completely for their effective access and use of information. Furthermore, exclusive rights given to copyright owners to possess, use and distribute is against the original copyright concept of having the rights shared between owners and users (European Commission, 2001; 2008; Ouma, 2006). This implies that as much as the owners earn their benefits from their intellectual creativity, they should not do it at the expense of the public good as is the case today. This would have been the reason why Bollier (2002) asserted that creators ought to be allowed to benefit from their creative works for some time, but his benefits ought not to be rigid and perpetual at the disadvantage of users.

Currently there is rampant infringement of creative works by university users and many excuses are given for this sad situation, top on the list being that information materials are too expensive. But why are the materials expensive? They are imported from Europe, India, and USA. But why should they be imported? It is because there are very few materials produced locally. This is the case, because local creators see no point in publishing materials only for them to be infringed. It is a vicious cycle. The Kenyan government is estimated to lose revenue amounting to over Ksh.2 billion annually due to unauthorized reproduction of copyrighted works (Wako, 2007). The fight against this vice is of great importance to authors, but it is of even greater value to universities. Therefore for purposes of sustaining creativity, generation and dissemination of new knowledge, copyright needs to be upheld by the university communities at all costs, which is not the case today.

Literature Review

Copyright has undergone tremendous metamorphosis from its original meaning that affected only a few individuals to a situation where it nearly affects everyone in the world today. Problematically, copyright has focused primarily on rights of copyright owners at the expense of users, or else has underestimated the latter in its attempts to explicate the former (Brinson et al, 2000). On the other hand, copyright law provides protection for creators by providing them with 1) right to copy; 2) right to prepare derivative works; 3) right to distribute copies of the work; 4) right to perform the work; and 5) right to display the work, which form the fair use guidelines in copyright law. Frase (2004) alluded that copyright places on a library user restrictions on copying from published books and electronic databases, but seemingly fails to strike an objective balance between protection and commercial concerns of copyright owners, academic, research and professional needs of library users. It also seeks to find a balance between the legitimate economic and moral rights of creators of works and needs of users (Shay, 2005). Educationists have also strongly argued that research and educational purposes are valid reasons for limited copying exceptions. However, Williamson et al (1992) clarified that copyright law does not define specific limits on the amount of copying allowed, but states that a person could not copy a “substantial” amount from a published copyright-protected work, as this could infringe the copyright owner interests. The legislation relating to copying for the purposes of research and private study applies to literary, dramatic, musical and artistic works. It does not extend to sound recordings, films, broadcasts or typographical arrangements. The single copy made for purposes of research or private study should be acknowledged as long as this is practical as there are no exact statutory copying limits contained in the Copyright Act or successive legislative statutes.

Fisher (2004) points out that copyright represents a bargain between users and authors in which users grant the latter certain exclusive rights in exchange for access to their creative works in two forms: access to information resources during exclusive rights’ period and unfettered access to information resources after those exclusive rights have expired. Frase (2004) notes that if the creators of information were given no rights to control use made of their works, they might receive fewer revenues and thus lack an appropriate level of incentive to create more. Likewise, fewer resources would be devoted to information creation than their social merit would warrant. Unauthorized copying, therefore, may reduce the incentives for creating and disseminating information.

Cohen et al. (2006) calls copyright ‘working through culture’ and explains that it involves physical interactions among information users. On the other hand, Fox and LaMacchia (2003) acknowledges the fact that existence of fair dealing principles and limited exceptions allow library users to take limited portions of others’ copyrighted information for some qualified uses without prior permission. This argument may have made Bacher (2000) to conclude that copyright was purposefully designed to address tension between public interest in increasing the storehouse of information and authors’ needs in obtaining compensation to secure pecuniary returns for their efforts.

Methodology

This study employed a combination of across-sectional survey and naturalistic research designs. It also reviewed available relevant literature on the study. The study covered six universities, comprising of three public and three private namely: University of Nairobi (UoN), Kenyatta University (KU), Moi University (MU), Catholic University of Eastern Africa (CUEA), United States International University (USIU) and University of Eastern Africa-Baraton (UEAB). The

researcher used stratified and simple random sampling to select the teaching staff and student respondents. Two librarians were purposively selected from each university in the study. The respondents therefore comprised of 294 students, 51 teaching staff and 12 librarians drawn from the main campuses. Data was collected from library users using questionnaires, while librarians were interviewed. The data collection instruments were used concurrently to save on time.

The study was guided by the following objectives:

1. To examine the level of awareness of the copyright law by university library users in Kenya.
2. To explain the extent to which Kenya Copyright Act (No 12, 2001) affects access and use of information resources in Kenyan university libraries.
3. To establish the challenges users experience in accessing and using copyrighted information resources.

Study Findings

Response rate

The study sought to establish the distribution of respondents and their response rates. The results of the study were analyzed and presented as displayed in table 1 below.

Table 1: Response rate (N=357)

Category	Sample size	Respondents	%
Students	360	294	81.7
Teaching staff	60	51	85
Librarians	12	12	100
Total	432	357	82.6

The table shows that there was a 81.7% response rate from the students, 85% response rate from the teaching staff and 100 % response rate from the library staff respondents.

Awareness of Copyright Laws

The study sought to establish whether the respondents were aware of copyright law. Those who were aware were further asked to state how they become aware. This question was asked because user awareness of copyright was crucial in the use of copyrighted works. The findings of the study are as shown in table 2 below:

Table 2: Awareness of Copyright Laws (N=357)

Category of Respondents	Responses			
	Aware %	Frequency	Not Aware%	Frequency
Students	58.5	172	41.5	122
Teaching staff	20	10	41	80
Librarians	83.3	10	16.7	2

When the respondents were asked how they come to know copyright law, (36%) of the user respondents stated that they were made aware through library user education programs, (12%) mentioned international and local workshops, conferences and seminars. One student from CUEA stated that she became aware of copyright law through class teachings. A teaching staff from UoN indicated that he became aware of copyright when he was asked to present a paper on copyright in an academic forum in another university. Some teaching staff (30%) and (40%) of student

respondents indicated that they were made aware through copyright brochures, policy pamphlets and bulletins that have been placed at strategic in their library. Teaching Staff, 2(4%) and 29(10%) of student respondents stated that they became aware of copyright through university copyright policies and personal studying. Many librarians, (90%) stated that they became aware have been made a way of copyright through their nature of work –acquisition, organization, repackaging and dissemination of information to varied library users with a librarian from MU emphasizing that as a Librarian who is charged with the responsibility of providing user education to library users, he is therefore supposed to be more knowledgeable than users on many matters including copyright law.

Copyright Training for Respondents

The study sought to establish whether respondents have had any copyright training and the findings were analyzed and presented as shown in table 3 below.

Table 3: Copyright Training for Respondents (N=357)

Category	Responses %		
	Yes	No	Not Sure
Students	12.5	13.3	83.3
Teaching staff	82.0	86.7	16.7
Library staff	5.5	0	0
Total	100	100	100

Those respondents, who stated they were trained, included (15%) who argued that they studied copyright on their own. For example a student from UEAB stated that copyright study modules are readily available on the internet for those persons interested in self training. This means that there is room for copyright training through self initiatives even if it's not part of the university syllabi. Some students, (25%) pointed out that they learned copyright through library orientation conducted by librarians during their first year at the university. However, how this can be achieved is debatable because research findings show that most of the librarians in the surveyed universities reported to have no or limited copyright knowledge.

A reasonable number of teaching staff, (26%) and librarian respondents (55%) stated that they learnt copyright through attending and participating in local and international seminars, conferences and workshops. A Librarian from MU specifically stated that she went for the copyright training organized by WIPO in Geneva in 2009. Minority of user respondents, (5%) stated that they acquired the copyright knowledge through by going through their university copyright policy. These points to the fact that if copyright policy is comprehensive enough with clear simple language, then it could also form a good tool for user training. A negligible number of respondents, (2%) stated that they learnt copyright through colleagues and friends. It is a normal trend in universities for information users to seek information from their classmates or teaching colleagues for the knowledge that they don't have. Some of these discussions just come naturally, in the processing of sharing some topic discussions.

Respondents' explanations for not having had training were varied. Some respondents, (25%) said that they have not had it because librarians who are charged with the responsibility of training them have not done so. Respondents, (17%) indicated that they have not gone for training because they don't know where to go for the same. While, (5%) thought they did not need copyright training, considering that they have been studying and teaching in the university without copyright knowledge and have succeeded in their university endeavors. Student respondents, (64%) pointed

out that they have not been trained because copyright training is not part of the university curriculum. The study findings seem to imply that majority of the user respondents and librarians have not had any copyright training. These findings are contrary to the expectations of the researcher, because teaching staff by virtue of their jobs were supposed to be more knowledgeable than students yet this was not the case. Even much surprising, over a 1/3 of the librarians were not trained and yet they were supposed to play a key role in not only providing copyrighted information resources, but also implement and create awareness of the same.

Copyright Effects on Access and Use of Information Resources

The study intended to find out whether copyright law had any effects on access and use of information resources and the findings were analyzed and presented as summarized in table 4 below.

Table 4: Copyright Effects on Access and Use of Information Resources (N=357)

Category	Responses %		
	Yes	No	Not Sure
Students	68	19	13
Teaching staff	58.8	41.2	0
Library staff	66.7	33.3	0

When asked on how copyright affected them, majority of the librarians, (78%) argued that copyright is making user access and use of information difficult through introduction of contracts and licenses by reproductions organizations like KOPIKEN. University libraries are required to pay some amount of money to copyright owners through KOPIKEN for reproduction of creative works. This means users have to spend more to foot these extra expenses. Respondents, 57(16%) stated that Digital Rights Management and Technological Protective Measures are locking up valuable information that they would have otherwise used. This is not good, because ‘orphaned works’ and public ‘domain works’ should be free for access by all users, yet they are also prevented from access. Some teaching staff, (12%) lamented that information users are only limited to a substantial amount of photocopying which is unfair and unrealistic for teaching purposes. They further argued that teaching requires extensive consultations of varied information resources. A student from USIU stated:

My university has limited information resources for use against many users; therefore the demand for these resources is very high. We cannot afford to buy every book that we need at the university. For those who can afford to buy, they cannot get them locally, because of limited publishing locally. Some of these books are even out of print, yet the copyright laws limit us to minimal reproduction. This should be stopped henceforth to avoid further inconveniences to us in the access and use of information.

Respondents, 29(8%) were of the view that their use of copyrighted works has been strictly limited to four factors namely: character of use; nature of copyrighted work; substantial portion of the work used in relation to its whole and the potential effect on market value of copyrighted work. It further limits their photocopying to a mere, 10% of the whole document But the common question that 10(4%) of respondents had was how long it will take to trace a particular author, when maybe the assignment or lecture has to be done urgently-say in a day or week’s time?. Copyright further restricts users to educational use, parody, research and review and not for non-educational purposes as argued by 45(13.6%) of the respondents. This is absurd, because what is meant by educational and non- educational. For example, “is studying for improved farming educational or not?” A student from KU asked. This may have been the reason why 75(21%) of the respondent stated that copyright law is vague and narrow in its provisions thus negatively affects user access and use of information.

Many, (45%) user respondents pointed that for them to effectively access and use the copyrighted resources; they need to have adequate knowledge of copyright law. But this is not the case at present. They instead use the resources with the fear that they might be infringing on the rights of owners. Some respondents, (10%) urged that copyright exceptions and limitations are difficult for them to understand. One teaching staff from UEAB further pointed out that he cannot make a distinction between ‘substantial’ provision and 10% allowance for reproduction of creative works as envisaged in the Copyright Act. It could therefore be conveniently argued that copyright affects access and use of information negatively and positively. These findings imply that urgent measures need to be taken by policy makers to mitigate the negative effects for users to effectively maximize information use.

Users’ Challenges in Using Information Resources

The study sought to find out the challenges that respondents were facing in accessing and using information resources. The results were obtained and presented as shown in table 5 below.

Table 5: Challenges in Use of Information (N=357)

Challenge	Frequency	Percentage
Weak Kenya Copyright Act	72	20.2
Lack of copyright knowledge	64	18
Limited information resources	54	15
Inadequate and incompetent library staff	43	12
Outdated retrieval tools	36	10
Rampant usage of DRMs and TPMs	36	10
High infringement penalties	25	7
Limited time to use	17	4.8
High costs of resources	11	3
Competition for resources	11	3
Poor infrastructure	4	1
Total	357	100

Majority of the respondents, (20.2%) stated that the Kenya Copyright Act (No.12, 2001) was weak to effectively serve them well. It has discriminated against distance and challenged information users. Respondents, 64(18%) stated that they lacked copyright knowledge. Respondents were found to have had no formal or informal training in copyright. This would be attributed to the fact that there exist no copyright academic units at any of the universities surveyed, other than for that students doing law degree. This puts users at an awkward situation, since they cannot be in a position to observe the law they have no or limited knowledge about.

University libraries have limited information resources as stated by 54(15%) of the respondents. None of the library surveyed would boast of having sufficient information resources for the users. This scarcity of resources has caused stiff competition in the use of available information resources amongst users as argued by 11(3%) of the respondents. Inadequate and incompetent library staff to assist users in tracing materials was also cited by 43(12%) of the respondents. University libraries in Kenya are currently understaffed. Respondents, 36(10%) stated that outdated access tools were an impediment to their effective access and use of information

resources. All universities were found to have inconsistent and outdated retrieval tools. These tools include catalogues, indexes, shelf lists and signage. Respondents, 36(10%) decried the high rampant use of DRMs and TPMs to tighten user access to electronic resources. Copyright owners have lately resorted to using these devices to protect their work against unauthorized use. Respondents, 25(7%) pointed that penalties set for users who infringed copyright materials discourage them from effectively using information. This is true in Kenya, where copyright infringers have court fines ranging from Kshs100 000/= - Kshs.800000/=. This is quite high, considering that the average per capita income in Kenya is quite low (approx. \$1 per day).

Limited time to use information resources was cited by 17(4.8%) of the respondents. They argued that they have a lot of assignments, term papers and research to do, but they have limited time to consult information resources. Instead, they opt to do class work through class discussions or consultations. This is true considering that university curriculums in Kenya especially for the undergraduate have many units (estimated at an average of 52) that have to be completed in eight semesters. University information resources are expensive to purchase as argued by 11(3%) of the respondents. These could be attributed to the fact that most materials are imported from the western world, since local publishing cannot adequately meet information users' needs. Universities in Kenya are faced with poor infrastructure as pointed out by 4(1%) of the respondents. Libraries lack adequate computers, internet bandwidth is limited and not well developed, poor internet connectivity and non functional interlibrary frameworks.

Other challenges to access and use of information as stated by users included rampant library malpractices. These include theft and mutilation of the information resources. This is necessitated by poor habits amongst users, where a user, because of selfish motives decides to steal, hide or destroy an information resource for personal gain at the expense of the other users. For example, in USIU the study independently established that the library loses over 500 books every academic year through theft. However, the root cause of these malpractices could be attributed to limited information resources that lead to high competition for the use available limited resources.

Discussions

It was evident from the study that majority of respondents were not aware of copyright laws. These ratings imply that the level of awareness of copyright law among the respondents was quite low. These findings concur with Smith et al. (2005) who surveyed 446 faculty members in health sciences at a U.S. university and found that 56% of users had limited knowledge, 6% had no knowledge, and 88 % reported not to have had any formal instruction in copyright and yet all respondents had either published a book or an article in the newspaper .Williamson (1992) also surveyed 151 university educators in the United States and found that rampant copyright infringement occurs due to lack copyright awareness. However these findings were not in line with Cox (1998) who compared self-perceptions of principals, educators, and librarians on awareness of copyright provisions and compliance with the principle of fair use in an academic library in the USA. The study findings established that only 57.3% of library administrators were rated as having high or very high levels of familiarity with Copyright law.

Smith et al (2005) in validating Merges (2003) line of thinking notes that majority of the information users were ignorant about the existence of copyright and advised librarians to be kingpins in dispelling copyright myths, and clearly articulate what copyright is and what it allows and further provide accurate advice to library users. On the other hand, Karimi (2009, p.2) while supporting May (2006) argument, advises librarians to be “knowledgeable, accurate and

current on advising users on information access and use copyright guidelines.” It was also evident that majority of the librarians have not internalized copyright matters to effectively assist library users with the process of discovering, vetting, and ethically using copyrighted information. In line with these findings, one librarian recommended that:

It ought to be a duty of every librarian to assist and educate patrons about copyright, with a possibility of every university library having a full time copyright librarian for user copyright guidance in access and use of information. This will not only go a long way in ensuring continual copyright awareness of library users about its development nationally and internationally.

Lack of or limited knowledge of copyright does not seem to be only confined to librarians and users in Kenyan universities, but similar situations have been reported in universities outside Kenya. For example, librarians or faculty members with low levels of copyright knowledge were reported in Zimbabwe (Olaka,2010) where it seemed little knowledge about copyright was the most plausible reason that made many librarians and users to continuously infringe information materials (Matsika, 2007). In Uganda, Kawooya (2010) points out that librarians are just starting to think about copyright and how they can incorporate it in institutional policies. In the United States, Smith et al. (2005) found out that 292 (62%) of Health Sciences Faculty in 2 universities had limited or no knowledge of copyright law and little or total lack of copyright awareness was also evident among information users. These research findings seem to concur with Litman (2001, p.54) copyright dismissal argument that:

I have complained more than once in this book that copyright law is complicated, arcane, and counterintuitive, and people don't believe copyright law says what it does say. The reason people don't believe in copyright law, I would argue, is that people persist in believing that laws make sense, and the copyright laws don't seem to them to make sense, because they don't make sense, especially from the vantage point of an individual end user.

It is therefore critical that all library staff and users undertake short/ long term copyright training on regular basis in order to have adequate knowledge and skills for effective access and use of information. On the other hand, the greatest impact in enhancing librarians' knowledge of copyright issues lie in library schools that ought to establish courses that are specifically geared to teaching of copyright issues, because this component is lacking (Ondari-Okemwa, 2000).

The study found out that more than half of the student respondents noted that copyright does not affect their access and use of information, while the majority of the teaching staff and librarians agreed to the fact that copyright affects them. The students' response may be attributed to the failure of the Kenya education system to incorporate copyright syllabi in their education curriculum right from primary, while the teaching staff and librarians' positive response would be attributed to their experiences and exposure in the use of information. These findings were in line with Cohen et al. (2006) who refers to copyright as working through culture and involves physical interactions among embodied users of information. He further advises that intellectual creativity requires access to information and some freedom to manipulate and play around with them in a context that allows for serendipity. Those who responded that copyright does not affect them were in contravention of Ouma (2006) argument that copyright affects virtually everything that a human person does.

University library users have perhaps an even greater responsibility for understanding copyright law than other users since a university is a complex system with copyrighted materials not only being used but also generated. Wesley (2007, p.10) pointed out “copyright law in the university library environment is a gray, cloudy entity with many interpretations”. Radin (2001) instead advises library users to change their focus from paying attention from what is forbidden by copyright law to what is permitted. In view of this Lessig (2004, p.19) recommended that library users should:

First consult copyright guidelines in their university library. If those guidelines seem to prohibit the proposed use, they should then weigh the four fair use factors (purpose of use, nature of work, amount used, and effect on potential market of the information) to determine whether proposed use could possibly fall within the definitions of fair use.

Challenges Users Experience in using Information

The study established that copyright awareness among university library users was very low, which puts user information access and use in a precarious state; especially for the teaching staff who are supposed to impart knowledge, yet they have little or no knowledge of copyright. Library users were found trying to follow the copyright law blindly by muddling around it without understanding it and end up getting misguided. Many information users think copyright law is invisible to them, either by ignorance or subconscious disregard due to their copyright perception; yet, it profoundly shapes their daily teaching and learning (Lessig, 2004). Guilbault (2000) validates the above study by arguing that he tries not to violate the rules, as he understand the rules, but he also do not want to spend a lot of time thinking about them.

Copyright Balance

Criterion of copyright originality as an essential instrument in drawing a line between what is protected and what belongs to the public domain was not clear among majority of respondents. Many respondents viewed the dichotomy between idea and expression of a work and that only the latter is protectable as a concern for copyright balance. This copyright balance is further threatened by technological and legislative changes, because information traditionally outside copyright scope has become indirectly covered by sui generis rights (Samuelson, 2003). However, these study findings are not in line with the United Nations declaration of 1957 that everyone has a right to freely participate in the community cultural life and enjoy the arts and to share in scientific advancements. Therefore, keeping a balance between copyright and access to information is, and will remain, a major challenge to an information user if it is not addressed wholesomely.

Exceptions, Limitations and Technology

Many respondents stated that copyright exceptions and limitations as provided for in section 26 of the Kenya Copyright Act continue to be weakened through the growing use of contracts and technology. The fair use provision is also uncertain due to lack of formal interpretation. Exceptions and limitations have been put under licensing and assignment agreements, with licenses being gotten by universities through a reprographic rights organization. (Ouma, 2006; Rwalinson & Lumpton, 2007). The copyright law further makes it complicated for a user, because although it has provisions for licensing, the provisions are narrow and do not cover Technological Protection Measures (TPMs), yet TPMs by way of anti-circumvention have continued to marginalize the already insufficient body of Exceptions and Limitation, as they do not distinguish between uses that require authorization and those that fall under statutory (Schechter & Thomas, 2003; William, 2004).

Copyright Scope

Copyright durability is unrealistic and unnecessary considering that 50 years plus is a very long time for the document to qualify to be in the public domain, because no works have ever entered the public domain in the lifetime of any user (Olaka, 2010). There also exists no comprehensive national or global registry to enable a user to ascertain the owners of copyrighted works and the uses that those owners will and will not permit. It can also be confidently argued that copyright is a tool that compromises integrity and utility of information collections and prevents preservation of information resources.

Recommendations

Awareness of Copyright Law

All library users and staff should be educated formally and informally on copyright law and its application. They need to understand the economic, legal, ethical and social issues surrounding their access and use of information and demonstrate vast copyright knowledge. This will make them appreciate the importance of copyright landscape for effective discovery, analysis and integration of information resources into their learning, teaching skills and personal development. The training should encompass privacy, censorship and plagiarism. On the other hand librarians need to find opportunities for sharing best practices, experiences and learn from each other's copyright approaches and strategies. On the other hand, library schools should re-design their curricula to allow library students to train as qualified copyright librarians.

Kenya Copyright Act (No.12, 2001) Amendments

It is recommended those technical terms such as 'fair dealing', 'fair use' 'substantial amount of work,' 'reasonable amount of work' are controversial and need to be redefined and clarified to avoid copyright ambiguity. Expansion of Exceptions and Limitations should also be done to allow use of increased amounts of works for educational purposes, instead of limiting it to two short passages. DRMs and TPMs should also be factored in the amendments to mitigate their negative effects to users.

University Copyright Policies

The universities need to create copyright policies. Librarians and the university communities must work together to identify their copyright needs and perspectives and to devise policies that reflect actual demands and that garner wider support from information users. Librarians must seek guidance from faculty, administrators, students and legal counsels when they formulate the copyright policies. A widely accepted copyright policy needs support from outside the university community. Endorsements from diverging interest groups and Kenya Copyright Board would no doubt give enormous credibility to the policy.

Conclusions

.Copyright affects access and use of information positively and negatively. For copyright laws to serve library users effectively and efficiently there is need for urgent amendment of the limiting clauses. Copyright training of users and librarians is essential in maximizing use and dissemination of information. Universities also have a responsibility of establishing watertight copyright law policies not only to guide librarians in copyright implementation of law, but also provide a roadmap to information access and use. Creation of copyright user awareness through trainings and regular workshops is important for effective access and use of information. All these can only be achieved if there is a political goodwill from the government.

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Is the Kenyan Public Given Enough Information About Presidential Opinion Polls?

By

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Abstract

According to Zaller (1994), public opinion can be defined as “the aggregate of responses to nationally representative polls” (p.264). Over the years, since the times of George Gallup, pollsters have taken it upon themselves to measure what the public really believes on various issues as unobtrusively as they can. To the pollster’s opinion polls, if done in a scientific manner can be used to gauge public opinion by scholars, the public and political decision makers. Conversely, those skeptical about opinion polls think that they are of limited use because most citizens have a limited understanding of public issues and that most information provided by respondents is insincere which leads to insincere data being published and used for analysis and interpretation. In Kenya, the use of opinion polls to predict presidential election outcomes gained prominence during the last two presidential elections that were held in 2007 and 2013. However despite the use of opinion polls by the different pollsters to predict presidential election outcomes in the country, their predictions have always raised numerous questions about their validity after each election. The Kenyan public just like the politicians appear not to believe in the presidential opinion polls. In this paper I argue that there is need to instill confidence in the public about opinion polls. One way to instill this confidence is through providing as much information to the public as possible. This however has not been the case so far. This paper will therefore focus on the way opinion polls have been presented to the public by both the pollsters and the media and how the presentation has failed to instill confidence in the public about the opinion polls. I focus on the information given to the public by the two major pollsters in the country that is Ipsos Synovate and Infotrack Harris. In addition I also focus on polls published by the two major print media houses in the country, that is, Nation media group and the Standard group together with the new media. Among the issues I will discuss in the paper is whether the pollsters provide enough information concerning sample size (explaining why they use absolute sample size as opposed to relative sample size), population, question wording (in such a way that will force people to think about each issue the same way each time they confront it), timing of polls, issues dealing with margin of error, and sponsor/s of the polls. I will also focus on the way journalists report about the opinion polls to the public and how their reporting has affected the public trust on opinion polls.

Keywords; pollster’s opinion polls, journalists, information, Nation media, politicians

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Introduction

According to Zaller (1994), public opinion can be defined as “the aggregate of responses to nationally representative polls” (p.264). Therefore public opinion can be interpreted as the opinions of many individuals examined as a group. The assumption here is that all opinions collected from the public are of equal value or importance. The father of scientific polling, George Horrace Gallup believed that polling could make democracy work more effectively if properly conducted and interpreted in a scientific manner (Hogan, 1997). This is because before Gallup came up with his polls, Americans relied upon polls conducted by the *Literary Digest* to predict Presidential results but whose methods of collecting the data Gallup did not approve (Hogan). He therefore infused scientific methods in the polling process and was able to predict correctly the American Presidential results of 1936 though the difference in percentage points between what he had predicted and the actual votes missed the mark. He went on to predict correctly the American Presidential polls of 1940 and 1944. To Gallup, polling had moved from being a fortune telling affair to a science that the American public could rely on to make accurate predictions of who their next President would be (Hogan). However in 1948 the Gallup poll wrongfully predicted that Thomas Dewey would defeat Harry Truman in the Presidential election. As it actually occurred, Harry Truman actually won the race and the predictions made by George Gallup came to haunt him for a long period of time as the American public put him under intense scrutiny in a way that also helped him and other pollsters improve on their polling. The American public demanded for more information and answers as to why Gallup’s prediction went wrong.

Why then would George Gallup and other pollsters that followed him believe that public opinion (carried out through a survey) on different matters from Presidential elections to other issues affecting society were important to enhancing democracy? Firstly it is because “an opinion survey with several hundred randomly selected respondents can provide a reasonably accurate representation of the preferences and beliefs of millions of ordinary citizens’ public opinion on a scale which governments may well find it prudent to heed”. (Shapiro, p.11825). Secondly, public opinion polls give voice to the majority on issues affecting them. In many cases and especially in developing countries this voice is normally in the hands of a few elites with the majority going by what the elites decide (Kiage & Owino, 2010; Wolf, 2009). Thirdly public opinions are used as the basis of straight forward extrapolations and projections (Schiff, 1994). For example to describe the distribution of opinion on an issue and fourthly specific opinions are associated with more general concerns of the public (Schiff, 1994). Fifthly they are important for administrative utility for example in prioritizing programs based on public views (Rochefort & Boyer, 1988).

Skeptics of opinion polls on the other hand have tended to dismiss their utility in society for a number of reasons. Some scholars have argued that responses by the public are inconsistent across issue and unstable over time and that the public which responds to such polls is “uneducated, uninformed and inattentive, intellectually limited”. (Converse, 1964 as cited by Schiff 1994) while other scholars have argued that responses given by respondents are patterned in many different dimensions (Schiff). Therefore such a public cannot provide data that can be relied upon in any meaningful way. Despite the skepticism, it appears that the good derived from public opinion polling outweighs the bad in that there has been an increase in polling not only on electoral and political issues but also on the economic and social front as evidenced by the growth of polling organizations in the developed countries like United States of America and Britain and also in developing countries like Kenya (Kiage & Owino, 2007) though the developed countries are way ahead in this field.

One of the ways that helped in the growth of opinion polling in western countries like the United States of America was through the provision of a lot of information to the public by pollsters such as Gallup which was then subjected to thorough scrutiny by the same public in order to gauge its strengths and weaknesses. Pollsters did not just release figures to the public and left it at that. In fact the public through various stakeholders were actively involved in the whole process. That is why when Gallup wrongly predicted the outcome of the 1948 American Presidential poll, the public through social scientists, journalists, politicians and the Social Science Research Council set out to investigate what caused the debacle (Hogan). However in Kenya where opinion polling has picked up in the recent past (as evident in the 2007 & 2013 elections) owing to improved democratic and electoral practices, there appears to be a disconnect between the pollsters and the public in general. This is due to the fact that information given to the public by the pollsters appears to be inadequate yet the same public has failed to find proper mechanisms to demand for full information concerning the opinion polls and subject it to proper scrutiny. That is why after the elections of 2007 and 2013 there were doubts over the validity of such opinion polls because the public did not fully understand them and therefore did not have full faith in them. There is therefore need to interrogate the adequacy and utility of the information given by the pollsters to the public in an effort to understanding their (pollsters) role in the democratization process in the country. This article is one such attempt to looking into this critical issue. I focus on the information given to the public by the two major pollsters in the country that is Ipsos Synovate and Infotrack Harris. In addition I also focus on polls published by the two major print media houses in the country, that is, Nation media group and the Standard group together with the new media. Using information given to the public during the 2007 and 2013 Presidential polls as case studies, I argue that pollsters together with journalists gave the Kenya public inadequate information on how the polls were conducted which in turn led the public to misinterpret and misunderstand that information.

I begin with a brief historical review of presidential opinion polling in Kenya. Next I analyze the kind of information pollsters and the major media houses gave the public during the two election periods of 2007 and 2013. In my evaluation of the information passed to the public, I focus on its inadequacy and the effects thereof. Lastly I suggest ways in which the whole process of electoral polling might be improved.

Historical Review of Presidential Opinion Polling in Kenya

According to Kiage & Owino (2010) Kenya has undergone different stages of opinion polling since the period of pre independence. They list those stages as a) the early pre- and post-independence polls in Kenya which was between 1960s to 1968, b) the single party state polls in Kenya between 1969- 1991, c) multiparty democracy and the 1992 pre- election polls, d) opinion polls and surveys between 1993 to 1997, e) 2002 pre-election opinion polls, f) the period after the 2002 elections which includes the 2003-2006 Afrobarometer IRI survey in Kenya, the 2005-2007 opinion polls and if I may add the opinion polls before the 2013 election polls. It is important to point out that during the pre-independence period and also during the periods under Presidents Kenyatta and Moi not much opinion polling took place in the country for a number of reasons. Firstly, and especially during the early years after independence, Kenya had not developed enough capacity in this area of public opinion polling and surveys in general. Secondly, as Kiage & Owino point out, Presidents Kenyatta and Moi did not give enough democratic space during their reigns to the extent of allowing those who would have opinions (whether political, social or economic) which differed with theirs to air their concerns? Thirdly

governments during their periods of rule interfered greatly with the electoral process and were accused of electoral malpractices that would have made election polling an exercise in futility since the polls conducted under them were not free and fair.

However after 1990, multiparty politics were re-introduced in the country as the political space opened a bit, though President Moi still had a firm grip of the country and did not allow free flow of information and opinion. In fact most media houses still feared reprisals from his government and never dared to oppose him. In addition majority of the media houses were largely owned by people who were still very loyal to him (Kiage & Owino). Therefore, not much development occurred in the area of free flow of information in the country. President Moi retired in the year 2002 and despite the government using massive resources to campaign for his preferred successor, Uhuru Kenyatta, Uhuru lost in his bid and this was correctly predicted by the pollsters whose presence had started being felt in the country.

The role played by pollsters in the democratization process in the country came into prominence during the general elections of 2007 and 2013. Presidential poll predictions released by Steadman group (which later became Ipsos Synovate), Infotrack Harris and other pollsters such as Centre for Independent Research, the Media Institute and Public Universities Research Team, among others, were given a lot of media coverage by both the print and electronic media. As a result many Kenyans became aware of their (pollsters') work and started paying attention to whatever information they released to the public.

There is need to understand the reason why the media gave the pollsters more coverage. Starting with the year 2007, the presidential election pitted Raila against Kibaki who had become great adversaries (Wolf, 2009) but who were being "refereed" by an electoral body that appeared before the eyes of the Kenyan public to be independent and impartial particularly after successfully conducting the 2005 referendum on the constitution. Therefore before the elections which were held on 27th December 2007, the media just like majority of Kenyans believed that the playing field during the campaign period and going into the voting day was free and fair. With this belief in their minds the media and Kenyans alike viewed opinion poll results as credible since they were being conducted in a conducive environment that allowed for fairness. As for the 2013 presidential election, Kenya had ushered in a new constitution which guaranteed fairness in the general election by putting in place an Independent Electoral and Boundaries Commission. Again just like in 2007, Kenyans went through the electoral campaign process and into the election voting day believing that the playing field was level and this again made poll results released by pollsters be considered credible by the media. The media therefore gave a lot of coverage to the polling results given by the pollsters in these two presidential polls of 2007 and 2013. Previous elections especially under Kenyatta and Moi regimes were done in hostile and unfair environments which would have made the work of pollsters an exercise in futility as I have stated earlier in this paper. It is also important for me to point out that the final results of these two presidential elections which were released by the two different electoral bodies were disputed but that issue is beyond the scope of this paper.

Despite the wide coverage of the presidential poll results released by the pollsters especially during the 2007 and 2013 by both the electronic and print media, it still appears that the Kenyan public does not fully understand those results because not all information is disclosed to them. The public, some of who participate as respondents in the polls do not fully comprehend the information given to them by the pollsters. Therefore information presented to the public from the pollsters in this form and by extension the media does not involve the public in the

excitement of the race (Bauman & Herbst, 1994). The public cannot fully decipher what they are given. The pollsters and the media have failed to give a sustained analysis of what the numbers and other information they pass onto the public actually mean. In the end we get to see the Kenyan public wary and confused by the information they are given including the numbers which eventually leads to misunderstanding and misinterpretation of that information. In the section that follows I will highlight a few examples to show this point which is central to my argument in this paper.

Analysis of Information Given to the Public during the 2007 & 2013 Presidential Polls Information on Sample Size

One of the major pieces of information given to the public by pollsters in Kenya when releasing results of their polls is the sample size of the people who participated in their poll. This sample size is normally in the range of a few thousand people compared to the population of voters in the country that usually runs into several millions of voters. Many Kenyans can therefore not fathom a situation where only a few people probably in the range of between 1000 and 2000 can correctly predict what is in the minds of several millions of people as to how they will vote. It is only people in the field of statistics and survey methods or who have knowledge of the same that clearly understand how that sample size works. This problem is acknowledged by Wolf (2009), one of the leading opinion poll consultants in the country who in reacting to a problem arising from what I have stated above wrote:

“Some of these were (the by now familiar) technical objections, such as the ‘nonsensical inadequacy’ of a sample size of ‘only’ 2,000 for an electorate of some 14 million, thereby inviting ridicule from several commentators and newspaper readers familiar with sampling methodology.” (p. 287).

As much as Wolf dismisses those who question the sample size used in such polls, he also acknowledges the fact that those with knowledge on sampling methodology are the ones who came to his defense. Otherwise many Kenyans including politicians have constantly questioned the sample size used and this might be a very good reason for them not to believe in the poll results. Below is an example of such questioning of the sample size used in polls by one Carol Kimutai from the Kenya Institute of Management to one of the staffers of Ipsos Synovate:

“Prodding her further, I inquire about sample size used by the company and whether it is really representative of the Kenyan population”. (Kimutai)

And below I quote the same Carol as she explains the reply she got from the staffer in relation to her above question.

“Using an analogy, she compares sampling to going to a doctor to test for malaria “A doctor then takes a blood sample which they use to test if you have malaria in your body. For national surveys in Kenya, a sample of 2,000 is adequate so long as it is distributed proportionate to population size across the various provinces and districts. The margin error is +/- 2.3 per cent. She cites France with a population of approximately 63 million where pollsters use a sample size of 1,000. “During the last election in the US, they used a sample size of 1,000 to represent over 250 million people. What matters is the distribution. It is a probability issue!” (Kimutai)

Assuming that Carol has no knowledge of sampling methodology, I am quite certain she did not get to understand how a sample of 2000 could be representative of the population of Kenyan voters. This is because the opinion poll staffer went into more technical jargon that did not make the issue at hand clearer. Carol was even lucky because she found someone who could at least afford to give her some explanation. However when pollsters present this kind of information to the public they do not explain how they arrive at their sample size. They do not explain why they use an absolute sample size as opposed to a sample size which is relative to the population size. On the other hand journalists covering these events usually relay it in the same way they receive it from the pollsters without much interpretation. The result is that majority of Kenyans are left doubting about the data presented to them. I do understand that pollsters may not have the luxury

of time to explain such issues to the public in great detail but there are other avenues which can be used. For example by fighting to be incorporated in the civic education movement where they can explain such issues because their work is becoming very important in the democratization process of the country. As for opinion polling staffers, they should read widely to get a good grasp of how to explain technical jargon in common man's language as there are many works (for example Nguyen, 2005) that have done a good job on that front.

Information about Question Wording

Going through copies of print media of Nation and Standard newspapers of 2007 and also 2012 and 2013, I never managed to get copies that had covered the issue of question wording and order in great detail. There is virtually no mention of this issue in the two dailies, an indication that they were hardly dealt with even by the pollsters. Yet question wording and the way questions are ordered are issues which have given survey researchers a lot of problems in trying to understand their effect on survey responses. According to Hogan (1997), under normal circumstances we would expect that "not only must questions tap appropriate, relevant opinions and attitudes; they must also mean the same thing to different respondents and inject no bias into the measurement process". (p. 168). I appreciate the fact that pollsters in the country have done a lot to check on the validity and reliability of the questions they ask in the polls. In addition, I am also aware of the literature on surveys shows which indicates that question wording may not be important in election polls as compared to issue based polls (Hogan). However the Kenyan situation provides a unique case where the commonly used languages in surveys in the country, that is English and Swahili are not native languages of the majority of people living in the country. There is therefore the danger of one question having different meanings to different people or different questions having different meanings to different people as pointed out by Gakero (2008). This issue becomes even more pertinent when, for example, a media house commissions several pollsters to carry out opinion polls at one go as was done by Nation media group before the 2013 elections. In such a case, the Kenyan public is left in the dark as to whether all the pollsters used exactly the same questions or if different questions which assumed the same meanings were used. It therefore becomes very difficult to convince the same public to believe in the same data when pertinent information relating to the way the data was collected is withheld and not given to them.

Journalists have not been of much help to Kenyans in respect to this issue. The public expects that journalists are their ears and eyes on the ground and that they should question the pollsters on such issues but either by omission or commission they have not questioned the pollsters and reported it to the public. Instead, apart from reporting about the different percentages that the different candidates are reported to have attained from the opinion polls, they have used little spaces and time to report on the "margin of error" of the polls. This type of reporting has given the wrong impression to the public "that sampling is the primary, if not the only source of possible error in a poll."(Cantril, 1991, p. 119 as cited by Hogan 1997)

Timing of the Polls

Pollsters in most cases have given information regarding the timing of the opinion polls very little time and space. In most cases the public is told of the period during which the polls were carried out only. For example the *Daily Nation* of February 21, 2013 in a report titled *Pollsters predict tough contest ahead in race for county seats* reported the timing as follows: "The interviews were conducted between February 14 and 17 with a margin of error of +/-2 percent and a confidence level of 95 percent." Other reports by the same daily of February 16th and 19th

on the polls did not even touch on the dates when the polls were done. A quick look at the *East African Standard* showed that in some instances no dates on when polls which were reported in the paper were given. For example no dates were given on polls reported in the paper on December 21st 2012 and January 25th 2013. It is possible that the pollsters gave the dates but journalists opted to leave them out of their reports.

By providing only the dates, the public misses out on contextual information that might inform it better on the choices made by respondents and why certain candidates performed in certain ways. Such information has always informed polling results in other countries. For example in the United States of America after New York City was hit by hurricane Sandy in October 2012, a *New York* poll and other polls carried out at around that time showed that President Obama's ratings rose considerably because the American public thought he had acted in a way that showed compassion towards victims of the hurricane. It is therefore important for pollsters in Kenya and the media alike to explain to the Kenyan public the reason behind the timing of their polls as a way of enabling the same public understand poll results much better and hence appreciating them. In some cases there might be no reason at all behind the timing of the polls and pollsters should make the public also aware of this fact. I would suggest that pollsters should include the timing of opinion polls as part of their presentations whenever they release poll results to the public.

The Role Played by the Media in Reporting Poll Results

The media has played a very crucial role in the democratization process in Kenya. It has been in the forefront of championing for democratic change in the country. Some of the ways it has done this is through giving wide coverage the constitutional reforms that have taken place in Kenya, checking on the excesses of the leadership in the country and informing Kenyans about such excesses among other many things. When it comes to reporting about opinion polls, the media especially print media have sensationalized news headings on opinion polls (Gakero, 2008) to the extent that many Kenyans have been able to read about them. However the content presented under the sensationalized headings is usually skewed in that in most cases it contains mainly the percentages scored by different Presidential candidates. The result of the way they present their news is what Price (2011) refers to as "issue framing" effects which he describes as follows:

"The ability of news, depending on the way it is presented, to systematically highlight some aspects of an issue rather than others and thereby alter the kinds of considerations people use in forming many opinions." (P. 850). Kenyans including politicians therefore end up thinking of the percentages attained by the different candidates as the main piece of information that they watch out for in those opinion polls because to them the candidate whom the polls show has the highest percent of votes is definitely going to be the next President. However this perception is wrong because it is based on wrong assumptions. For example it is based on the assumption that all voters from all regions will turn up and vote on the voting day which is practically not possible. Methodological information as I indicated earlier in this paper is seldom included and if it makes it in the papers it is usually in the form of one sentence story (as I indicated earlier) yet the inclusion of needed methodological information in poll stories leads to increased understanding and credibility among readers (Salwen, 1985). Avoiding including methodological information when reporting poll results might be due to the fact that newspapers are in business and they also need to make sales to sustain themselves in the media industry. Therefore editors might view spending much space reporting on opinion poll methodological information as wasting "valuable space" which can be used for other purposes.

Conclusion and the Way Forward

This paper has highlighted issues relating to information released to the public by opinion pollsters and the media in Kenya. I have shown how pollsters have managed to gain legitimacy in Kenya as a result of Kenyans putting mechanisms in place that ensure that elections are held in free and fair conditions. I have also highlighted some weaknesses in the information that is given to the public by both the pollsters and the media. Despite such weaknesses, the majority of Kenyans still have a positive outlook at opinion polls. The fact that Kenyans have come to embrace opinion polling as part and parcel of the electoral process was proven by a survey carried out by Steadman SPEC in 2008 which showed that majority of Kenyans recognized or were influenced in one way or another by opinion polls (Wolf, 2009). However some changes need to be done in the way pollsters and the media disseminate information regarding the polls to the public in order to instill confidence and trust in them as I have explained in this paper. Some suggestions are therefore in order.

Firstly, pollsters should strive to be included in the civic education program of the electoral process in Kenya. Through this program they will have an opportunity to explain to Kenyans in different parts of the country what they do and what their job entails. They should also use that opportunity to explain to the public using layman's language some of the technical jargon that they use when releasing information to the public. By taking this route, many Kenyans will be able to appreciate their work and embrace it since a lot of misunderstanding that usually arises from ignorance on the public's part will be done away with.

Secondly media houses need to train journalists covering opinion polls in survey methods. Alternatively they should hire journalists who are well versed in this field to cover such events. This is important because such journalists will question information given by pollsters with a critical lens and interpret it before passing it over to the public. They will also demand for information on behalf of the Kenyan public whenever it is possible. This will provide a different scenario from the current one where journalists rush to pass to their editors and the public poll information which is unfiltered from the pollsters in an effort to be the first ones to get the "breaking news" to the public.

Thirdly pollsters in partnership with the media and particularly the electronic media can try and introduce deliberative opinion polls (Fishkin, 1997; 2003) in the country. In this type of polls, a representative sample of people who participated in the original polls is called back to a face to face deliberation (sort of a town hall meeting) of the responses they gave during the original poll. The idea is that during the deliberative poll the people selected to participate have ample time to think over the responses they gave during the original poll while considering other competing arguments that they may have overlooked during the original poll due to lack of time. Though it may appear as time wasting and may also have financial implications, it is one way in which pollsters can use to popularize opinion polls and make people appreciate them especially if it is beamed on television networks across the country.

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The Daily Nation

The East African Standard

Toward a Model of Experiential, Field-Based, and Supportive Learning in Formal and Non-Formal Education Programs in East Africa

By

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Abstract

For youth who have dropped out of school or have completed schooling but found it has not prepared them with the necessary skills and knowledge they need, there are few opportunities for a secure livelihood for themselves and their families. Educational programs that focus on the transformative potential of education can impact how youth perceive themselves and the opportunities they can attain. This paper will consider key components of transformative education taking place in two NGO education programs in East Africa. These organizations work with marginalized youth in formal and non-formal educational settings and have developed a pedagogy that highlights three key components; experiential learning, relational empowerment and peer and professional networks. In this paper, we seek to understand how these components work together, the impact they have on youth and the potential they offer for the youths' futures. This study is drawn from over 120 youth interviews that were conducted at the beginning of a five-year longitudinal evaluation of entrepreneurial education programs. The role of experiential learning, relationships fostered in the programs, and the networks with which the youth engage were key themes that emerged as having significant impact on youths' perceptions of themselves and their potential for the future. Staff and stakeholders who were interviewed during the same time period also identified these themes as intentional programmatic components designed to bolster youths' potential. In the initial stages of this longitudinal evaluation, our findings focus on the programmatic emphasis on experiential learning, caring relationships and networks outside of the classroom as well as on the changes the youth have identified in their abilities and beliefs in themselves. Our findings suggest that these programmatic components have the potential to transform youth self-perceptions and livelihoods. This will be of particular interest to practitioners and scholars who seek to understand how experiential education can be transformative for youth.

Keywords; Educational programs, experiential education, relationships, entrepreneurial programs

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Introduction

Over the past two decades, the demand for secondary education has grown dramatically in East Africa. Successes of social change approaches such as “Education for All” and the Millennium Development Goals have increased both the attendance and completion rate of students in primary schools. Beyond primary schools, however, tremendous challenges still exist. In Kenya, for example, enrollment in secondary school may be as low as 60% (World Bank, 2012) of eligible students. Further, despite innovations to reduce or remove costs of secondary education, some families still view secondary education as an opportunity cost.

Abuya, Oketch, and Musyoka (2012) interviewed families in Kenya regarding attendance and completion in secondary schools. Recurrent themes arose for students. In a study conducted in Nairobi, school leavers cited a variety of reasons for discontinuing schooling. Among these were the perception that time spent in school was not relevant (or detracted from) opportunities for earning income. A second reason was that students often had negative experiences with teachers and did not feel motivated or confident to continue in school.

This article seeks to address such concerns and others that critique secondary schooling in East Africa. In the pages below, we present promising trends based on two case studies in East Africa. Data from this study are drawn from interviews with students and participants in one non-formal education program in Kenya and a formal secondary school in Tanzania. These themes, 1) that teachers are not the center of learning experiences; 2) learning occurs both in and out of the classroom; and 3) that learning occurs best in a highly supportive environment have been discussed in educational literature from both the Global North and South for decades.

Experiential Education

The first emergent theme from this study is that teachers are not the sole proprietors of learning experiences in schools. Rather, learner-based pedagogy can be characterized as “experiential” in nature. John Dewey (1938) described experiential education as “what (one) learns in the way of knowledge or skill in one situation becomes an instrument in understanding with the situation and dealing effectively with the situations that follow the process goes on as long as life and learning continue” (p. 42).

Experiential philosophies have been applied throughout the 20th and 21st Centuries in both formal and non-formal education systems. Stehno (1986) noted that experiential programs often have four main goals: 1) authentic experiences that create learning; 2) reflection upon such experiences; 3) abstractions drawn from the experience; and 4) application of the experience to new or novel situations. The fourth point - application of knowledge to new situations was Dewey’s original over-riding aim of experiential education.

Field-Based Learning

Experiential education pedagogies have more recently been applied in East Africa. Davis, Nkonya, Kato, Mekonnen, Odendo, Miiró & Nkuba (2012) utilized Farmer Field Schools (schools where agricultural trainees learn by doing on agricultural plots) using quasi-experimental methods. Female headed households and farmers with no formal education grew significantly higher yields than those who undertook traditional, lecture based agricultural training. In this example, learning occurred both because “students” were active participants in the learning process and because learning occurred in authentic settings.

Supportive Environments

In addition to learner-based and setting-based educational models, agencies (including the United Nations Children’s Fund - UNICEF) have engaged in Child-Friendly Schools development with partner nations. UNICEF’s focus on overall well-being of children has multiple components, one of them being a psychologically safe environment for learning. The evidence base for such environment has been demonstrated in literature from East Africa. Smith and Barrett (2011) examined survey data from the Southern and Eastern African Consortium for Monitoring and Quality to identify predictors of literacy achievement in Grade 6 learners. The authors found significant results indicating that for “primary school children the importance of love and care for children and learners of a similar age in this study is implicit within the two basic capabilities that concern who they live with. Primary school students who are free from the need to be self-reliant practically, emotionally and economically and children living with close family, most especially their own parents, are more likely to achieve higher levels of competence in reading.” (p. 31)

Based on the brief literature review presented above, we developed a research theory that moving away from didactic, teacher-centered, and emotionally distant educational approaches may be an effective approach to improving educational outcomes in East Africa. The remaining sections of this paper introduce a qualitative evidence base about student engagement in two programs - one in Kenya and one in Tanzania. These data provide preliminary evidence that 1) experiential, 2) field-based, and 3) caring programs may promote improved engagement in formal and non-formal programs for secondary school-aged youth in East Africa.

Methods

All data for this project were collected between the months of March and June 2012 as part of a broader evaluation of non-governmental organization-led education programs. Data collection was intended to solicit information on three key concepts: Learning (concrete educational outcomes of programs), Earning (experiences with and capacity for earning money), and saving (saving habits of youth). Pedagogical data that emerged were derived from items related to “learning” and volunteered by students at all points during interviews.

Procedures

In order to capture the perceptions of youth, evaluators employed two methods. First, demographic data was collected for all participants. Next, a sample of youth in two programs (61 in Kenya and 30 in Tanzania) participated in semi-structured interviews. Interviews were conducted by a team of two or three researchers: one local interviewer, one foreign university-based interviewer and one translator when needed. All interviews began in English in Kenya but at times, interview language switched to *Kiswahili* at the request of the youth. In nearly all interviews, interviewees used *Sheng* expressions (*sheng* is a dialect made of up of English, *Kiswahili* and local language expressions and spoken almost exclusively by urban youth). At times *Kiswahili*, English, and *Sheng* were used interchangeably in the interviews, both by interviewers and youth. In Tanzania, all interviews were conducted in *Kiswahili*. Interviews took between one half hour and one hour to complete. The interview protocol had open-ended questions with some probes for clarification.

Sample

In both countries, ‘disadvantaged youth’ were the target audience of educational programs. In Kenya, these youth were out-of-school individuals and Form 4 finishers who were jobless or

under-employed. All youth were between the ages of 18 and 25, with no further opportunities for study. In Tanzania, youth participated in educational programs as part of their formal schooling. Youth were currently attending secondary schools in rural settings and were between the ages of 14 and 18.

Findings

Experiential Education and Field Based Learning

Both Sasema and Njia strive to provide youth with an education that does not provide them with theory alone, but also gives them practical experiences that help them engage with and understand the material they are learning. The Njia staff stress that learning and assessment focus on making sure youth have had the opportunity to use and demonstrate the skills they have acquired, “Here my assessments may not be in the written way, it will be in the practical way. We come and we assess them and give them marks. That's how we look at the skills and the knowledge as such. So skills being imparted and skills being assessed, I think that is making sense.”

Youth acknowledge this difference in pedagogical approach and juxtapose it with previous educational experiences they have had. On youth indicated, “The program is skill based. The Kenyan curriculum, the 8-4-4 is full of theory, here you are able to practice what you have been taught, that is one aspect that is very helpful. If I practice typing I never forget it. If I practice wiring I know the red one is live wire, the yellow one is always neutral. When it is theory it will not sink, when it is practiced it is excellent.” The practice being offered by the two sites is varied and covers vocational, agricultural, financial and life skills training and takes place not only in the classroom but in the community as well.

In the classroom, youth are encouraged to be an integral part of the learning environment. As will be discussed in more detail below, teaching is not assumed to be something bestowed upon the youth by the teacher but is something that the students also engage with. Students are active participants in creating learning materials and through this process the NGO staffs anticipate that the youth will feel ownership over the program.

Youth are also engaged with hands-on training in the classroom. Through training in the vocational fields, youth practice what they have been taught, whether that is by fixing automobile parts, practicing with materials in the hospitality class or spending time on computers as they learn computing basics. The hands-on component is not only led by the facilitators but by mentors who are brought in from the community as well. For instance, the Njia program has an electrician who comes to the program to give hands-on training to the students. This hands-on practice is recognized as important not only by the NGO staff and students but by community members and business owners who are connected with the programs. They indicate that theoretical knowledge is not sufficient in the job market and “I see the issue of Njia coming in. To offer those technical, structured skills that when you graduate, it gives you opportunity to access jobs.” At Sasema, youth are also given the opportunity to develop small business models including chicken farming and the design, creation and marketing of clothing. Youth are encouraged to put their entrepreneurial skills to practice by starting small ventures that are implemented at the program site or with the program youth.

Outside of the classroom, youth are encouraged to learn more about the business environments related to their vocational training. As part of the Njia program, classes visit both large and

small-scale companies to better understand the working environment. Some of these organizations then provide youth with a one-month internship, which is an integral part of the Njia program. Aside from class sponsored interactions in the community, facilitators also encourage youth to do research about their vocational choices, which will help to boost their confidence, “The entrepreneurship teacher told us to go and research for the people who are working, and for example they have shops - some in the electrical field. When I went to where I stay, I found [one man] who was working, who was doing wiring and at the same time selling electrical equipment. So I went there to him and I asked him if I could get a chance for internship.” Not only does this type of interaction increase their knowledge of their vocational skills, but it also bolsters their confidence and their communication abilities.

Experiential education also takes place in the financial literacy components undertaken by the two programs. In addition to learning the value of saving and budgeting through mentors and facilitators, students are able to practice these skills through various savings mechanisms. On the one hand, youth are taken through the step-by-step process of opening a savings account. While many youth are not yet earning enough money to use the formal banking system, they are also encouraged to participate in savings groups, or *chamas*. These groups are set up through the program and the terms are determined by each group. Whether the savings rate is 5 shillings per week or 70 shillings per week youth are able to work through the decision making process together and experience the pitfalls and promises of saving.

Supportive, Caring Environments

Integral to their approaches to transformative education, the NGO programs in this study emphasize building positive, caring relationships between youth and adults and among youth themselves. This relational approach is based on the belief that transformative learning is not achieved in individual isolation, but is best enabled in community. While these NGOs are not East African in origin, this belief in the primacy of relationships aligns closely with many indigenous African worldviews, and particularly the notion of *ubuntu*, which as a concept has been described as “I am, because we are; and since we are, therefore I am” (Mbiti, 1969, p. 108). The Kiswahili saying, “*mtu ni watu*”, meaning an individual is people, suggests our identities exist solely in the context of our web of relationships.

In the NGOs’ programmatic contexts, supportive relationships are fostered through staff development, peer mentorship, adult guardianship, a group approach to learning and saving, as well as taught in the classroom context through the life skills curricula. The programs, therefore, focus intentionally on the cultivation of relationships aimed at supporting students’ social and moral development. Students describe this approach as resulting in a warm atmosphere and positive relationships. This girl from Sasema characterized her school as a loving space in which people are connected to one another: “I am proud of my school because there is love. It has people with love. There is closeness between students and students, and teachers and students.”

Turning to literature exploring caring, Nel Noddings (1984, 2005), was among the first to advocate for a relational ethic of caring in educational settings. This ethic involves an intentional privileging of a concern for human relationships, or relational ethics, in spaces of learning. Noddings sees caring as “the very bedrock of all successful education” (2005, p. 27) and describes the caring ethic between adults and students as similar to that of a parent and child, in which a special responsibility for student growth and maturation rests with the teacher. Indeed, adults in our study used similar language to describe the relationships they cultivated with youth

participants: “(T)he students here call us their parents, they don’t call us teachers. They say, my dad, my mom. It’s more of a family relationship rather than a teacher relationship. When you’re treating a student here, you have to treat her like your own child.” (Sasema teacher). This notion of creating a family of teachers and learners is reminiscent of both *ubuntu* and the Swahili language notion of *ujamaa*, or familyhood.

Differentiating the role of teacher from traditional classrooms is a particularly important part of the pedagogy for the Kenyan NGO. Those hired to provide instruction in the classroom are not referred to as teachers, but rather as facilitators who enable students to learn how to learn. CAP’s approach to hiring facilitators can be seen through the following comments, “I never look at it if they are a teacher. It’s not ‘I teach, you learn’ it’s the facilitation where self-learning is the major thing that happens. So these people have to make it such a way that the young people are capable of learning on their own. To create that environment for people to learn”

In Noddings’ notion of caring educational relationships, there are four foundational components of ethical care, all of which, we argue, are incorporated in the NGOs programmatic focus on relationships. We use these four components as a framework to analyze adults’ and youths’ understandings of the NGOs cultivation of caring relationships aimed at transformative learning. The first is *modeling*, which involves adults creating caring relationships that, in part, demonstrate to youth examples of what such relationships look like. The NGOs support adults, including teachers, mentors, trainers and counselors, in creating caring relationships with program participants. This is done via careful hiring practices, professional development and dialogue all intended to create a culture of caring.

As the Kenyan program considers which personnel to hire, they recognize that facilitators and mentors who are younger can serve as role models and that youth will connect with facilitators who are willing to engage with them in their environment, or are in fact from similar backgrounds. Program personnel highlight the importance of hiring facilitators willing to engage with youth, “It’s not just I will go to the class and I will get out of the class, no. You get out in the community. The conditions here in the slums are very, very hard. You see how they are living ... facilitators should not say ‘no, I can’t get out into the community.’”

Youth recognize and value the emphasis placed on these hiring considerations. One youth summarized the value of having young facilitators and mentors in this way, “they have selected young people. And these are like mentors to us. I will take an example of a facilitator, she’s young and she’s gotten to this far! Definitely I want to get that far. Ok you can be able to interact with them more than interact with old people. Them being young, they understand the problems / the challenges that youth go through. And ah, they are in a position to assist you.” In this quote you can see that young facilitators provide both someone with whom the youth can connect and someone that the youth can look up to and hope to emulate. A second youth described the inspiration that comes from interacting with young businesspeople in the community who also serve as mentors, “Mentors coming to speak with us have inspired us a lot. When we get a mentor I put myself in their shoes and I think about inspiring people . . . the mentor tells you what things to put in place to make sure you are successful.”

The second component of a caring ethic in education is *dialogue*, similar to the Freirean concept, which gives students and their teachers a forum for engaging in an active “search for understanding, empathy or appreciation” (Noddings, 2005, p. 23). For the NGOs involved in

this study, life skills classes offer the space to engage in dialogue. While the life skills components of the programs focused on a wide variety of skills and attitudes, there were three main areas that youth highlighted as contributing to their changing self-conceptualization and empowerment: communication skills, self-confidence, ability to relate to and respect others and empathy.

Youth use language pointing to their transformation as they describe the impact of the practice of dialogue found in the programmatic life skills components. This language suggests that youth are caring for themselves and others as a result of this practice: “Life skills, how to interact, how we socialize with people matters a lot . . . life skills has helped me to understand myself as Juma and not as somebody else.” Youth imagine how this caring for and knowing one and others will support their future well-being: “(Life skills) first is knowing yourself and how you can face these challenges . . . being self-confident... we are taught on how you can live in society and have good relationship.”

Noddings contends that dialogue, occurring in our case through life skills education; helps strengthen the bonds between people that enable the natural impulse to care. This impulse is then acted upon in her third component of ethical care in educational settings, which is *practice*.

Practice, in which students build their capacity for caring by actually performing it, is supported by the NGOs’ approaches to peer mentorship, peer group savings and service learning. Peer mentorship at Sasema occurs between pairs of older students and younger students. Under the guidance of adults, and within the structure provided by sitting together at meals, following up on academic and personal goals with each other and working together on entrepreneurial enterprises, peer mentorship affords youth an opportunity to practice caring for each other. The following quote demonstrates how students perceive they have changed as a result of practicing a caring ethic: “I have learned here at school to build relationships with people . . . having good relations with friends will help in my life. I have learned to be tolerant to different behaviors of people.”

While the Kenyan NGO has actively promoted peer mentorship and relationships, the value that youth have placed on those relationships is even more than what was anticipated. Youth indicate that they now have peers who are concerned about them, noting that they often check in with each other outside of the program as well. Additionally, youth talk about how they learn from one another and problem solve together, “Inside here we’ve been from different communities. We have aided each other in learning. We talk about the challenges we are facing. Yeah – those who are inside here – a part of [the program], we are great at interacting. I am from [one place], someone else is from [another] maybe he sees a certain problem. He is not able to tackle it. He may come and ask me...’how can you see it’. Through that we are able to communicate and be able to assist each other.”

A final component of students’ practice of a caring ethic is service learning. While we have less data on this because we were unable to observe this aspect, Sasema teachers described how students’ visits to orphanages and homes for elderly adults cultivated a shift in students’ perceptions of their own life circumstances. Specifically, they suggested that serving those less fortunate than themselves encouraged a growth in student’s gratitude.

Noddings’ fourth component is confirmation, in which adults affirm the best in students and encourage their development. Because our evaluation is built on interviews and not observation,

we were unable to observe this occurring. Nevertheless, adults we interviewed repeatedly expressed the changes that they saw in the youth, suggesting they acknowledge this with youth. Further, youth interviewees shared frequent expressions of gratitude for the caring adult relationships. This is something we will continue to watch longitudinally.

Continuous and boundless learning

What happens when youth experience caring as a part of the learning and teaching process while also gaining practical experience within a program? What happens when a young person ceases their most active involvement as a learner? What types of supports and networks are most helpful for youth to continue experiencing a supportive and nurturing connection while also extending their practical lessons into new areas? Most practically oriented programs for youth grapple with what happens when youth become alumni of their program. While formal networks and connections, often through Internet and phones, can help to keep youth connected in alumni networks, what youth do to internalize their lessons from a caring environment to make sure they get the support and skills they need in the future through seeking out mentorship and networks is largely unknown. It is too early in the programs in Kenya and Tanzania to know what youth will do after the program. However, some evidence has shown that even at the beginning of the program, youth are already thinking about how they will someday be alumni. This mental shifting and preparation for the future assists them in developing an alumni identity. One youth remarked that when new youth come into the program “then we'll be saying we are alumni of [the program].” Being an alumnus shows a sense of accomplishment and a shifted identity. Another youth remarked that they had started a group of alumni who met every weekend to contribute a fee in order to start their business idea. And several youth commented that the good influence of new friends they have made through their participation in the program helped them to deflect some of the negative influences, such as idleness, experienced in their home areas. Peers, particularly those within the program, serve as resources people for social and even capital accumulation support to start their own ventures and attain work-related goals.

External connection was not just with peers, connecting youth with a variety of mentors both within program lessons and experiential education experiences, youth learned how to ask for what they need and seek out help from people different than themselves. Mentors were seen by youth as “someone you will be able to talk to. A person who can give you direction, hope and skills,” according to two different respondents. Some practical skills, such as preventing HIV, helping to write curriculum vitae, and learning technical skills were also the role of mentors. Notably, several youth remarked that the way in which mentors behave made a difference to them, such as those who seek to inspire youth with a combination of practical knowledge and encouragement. In contrast to traditional teachers who are not focused on practical knowledge to “figure out what to do with these people [their students],” in contrast, “the mentor tells you what things to put in place to make sure you are successful” while also challenging the recipient of the mentor’s advice. One respondent remarked that “I have more than my competitors because I know what they [mentors] are doing in the field.” While program participants were quite enthusiastic about mentors during the program, the continuation of seeking advice from the same or new mentors would help to illustrate that participants had developed a skill of both identifying the help they need and knowing how to seek out the help and from whom.

As youth move from having regular interaction with fellow youth, facilitators / teachers in the program, mentors and organized activities such as experiential education, they maintain some level of comfort and connection to the program. How to sustain a similar level of support once

youth are relatively on their own remains to be seen. As one Kenyan youth stated, “I am managing time better. I am relating with my friends– ok my social status has improved. I always have something to do - whatever training we have we don’t just stop it here; we are supposed to go to do research. And some other stuff. My time is occupied. I don’t have idle time.” Yet any educator or parent would be concern about frustrations that develop when the fruits of one’s efforts do not yield the expected result.

Conclusion

Students describe the NGOs’ experiential and relational pedagogy and its impact on their lives in various positive ways, attributing a growth in their learning and well-being to this focus. Further, youth continually contrasted their current learning experiences and relationships as caring in comparison to their previous places of learning or working. These educational settings examples of the potential for education when experiential, field based education are offered in supportive environments. Over the course of this evaluation project we will be able to determine the long term impact this learning pedagogy will have.

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Ineffective tax system and challenges of development in Africa: evidence from Nigeria

By

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Abstract

A country's tax system is a major determinant of other macroeconomic indexes. Specifically, for both developed and developing economies, there exists a relationship between tax structure and the level of economic growth and development. Indeed, it has been argued that the level of economic development has a very strong impact on a country's tax base and tax policy objectives vary with the stages of development. Similarly, the (economic) criteria by which a tax structure is to be judged and the relative importance of each tax source vary over time. For example, during the colonial era and immediately after the Nigerian (political) independence in 1960, the sole objective of taxation was to raise revenue. Later on, emphasis shifted to the infant industries protection and income redistribution objectives. Several tax administrations has been put in place since independence but most of it are not well implemented or effective thereby slowing down the development process of the nation. The strength of the tax system of any nation determines to a greater extent the level of development it is going to witness. Generally in Africa, there is a high level of corruption which is serving as a disruption to good tax policies/administrations preventing the actualisation of the purpose to which the policies are formulated. In this paper, we will look at various tax systems in African countries and make comparisons as to the level of development each systems has brought to the nations and continent as a whole with particular reference to Nigeria.

Keywords: Tax system, Tax Administration, Development, colonial era, economic

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Olusola Olubukunola Oluwatoyin (2012). Ineffective tax system and challenges of development in Africa: evidence from Nigeria. *Kenya Studies Review*, Volume 7, Number 2.

Introduction

Over the years it has been observed that one of the most critical problem facing Nigeria is that companies and taxpayers, especially the rich hardly pay the normal tax they ought to pay as and when due so as to sustain economic development of the nation. The administration of taxes in Nigeria has mainly been focused on revenue generation to the detriment of stimulating economic development, providing infrastructure and basic social amenities. Some local government and dubious government officials introduces all sort of taxes and levies charged with different types of names, there have been incidents of high rate of forgery of official document such as tax receipts and other fraudulent practice in the issuance of tax clearance certificate.

Most of the tax laws in Nigeria are out date, manufactures are groaning under the burden of multiple tax payment in the states. Nigeria as a country is yet to develop an effective and efficient tax system, despite the fact that taxation has always been with us, our basic problem is that the enforcement machinery of our tax laws is so porous that anybody can go against it without being punished and this affects our economic development drastically. Various tax systems have been introduced in Nigeria since independence, and yet the development rate is still not too good compared to tax revenues collected yearly. Some parts of the nation are still wallowing in underdevelopment. Nigeria is still faced with the dearth of database; not having the information on how many taxable citizens there are, how many companies/businesses are operating on the Nigerian shores, how many are tax compliant, how many are evading or avoiding paying taxes, what level of development has taxation brought into place each year tax is collected? It is high time Nigeria move away from using taxation as just a medium for generating revenue but the performance of each fiscal year should be carried out to measure the level of development the fiscal year has brought in place. This will help the government to plan towards the next fiscal year, and when citizens, companies, taxable persons who are compliant can see evidences of their tax compliance that is in the level of development they would always want to do more. In developing countries the government has to play an active role in promoting economic growth & development because private initiative & capital are limited. Fiscal policy or budget has become important instrument in promoting growth and development in such economies.

Taxation is an important part of fiscal policy which can be used effectively by governments of developing economies. Tax is a contribution exacted by the state. It is a non penal but compulsory and unrequited transfer of resources from the private to the public sector, levied on the basis of predetermined criteria. The classical economic were in view that the only objective of taxation was to raise government revenue. But with the changes in circumstances and ideologies, the aim of taxes has also been changed. These days apart from the object of raising the public revenue, taxes is levied to affect consumption, production and distribution with a view to ensuring the social welfare through the economic development of a country. This study serves as an added contribution to the existing work of other authors that has discussed issues on effective tax systems such as Ariyo (1997), Gallagher (2005), Barriyima and Gladson (2009), Magaret and Chris (2009), Akintoye and Tashie (2013), Adeleke (2011) as it goes further to examine challenges of inefficient tax system as it effects development, and it is going to be useful to government agencies, fiscal policy makers, revenue mobilisation committee, economic planners and other interested bodies to expand their knowledge on the research topic as little is done on inefficient tax systems in Nigeria.

The main objective of this study is to:

Examine the importance of taxes as major revenue for governments

Analyse the impact of effective tax system on development

Identify the determinants of effective tax systems

Assess the importance of tax systems on some important development variables

Determine the relationship between effective tax system and development

Literature Review

A country's tax system is a major determinant of other macroeconomic indexes. Specifically, for both developed and developing economies, there exists a relationship between tax structure and the level of economic growth and development. (Ariyo, 1997). Tax is a contribution exacted by the state. It is a non penal but compulsory and unrequited transfer of resources from the private to the public sector, levied on the basis of predetermined criteria.

Tax can be defined as a compulsory levy by government on goods, services, income and wealth, primarily to obtain revenue. (Ariyo,1997). The classical economic were in view that the only objective of taxation was to raise government revenue. But with the changes in circumstances and ideologies, the aim of taxes has also been changed. These days apart from the object of raising the public revenue, taxes is levied to affect consumption, production and distribution with a view to ensuring the social welfare through the economic development of a country. In Owolabi and Okwu (2011) reported that the early works on tax effort include those of Musgrave (1969), Lotz and Morss (1970), Chelliah, Baas and Kelly (1975) and Tait, Gratz and Eichengreen (1979) which captured developments during the 1960s to the late 1970s. Musgrave (1969) noted that the tax performance of a developing country can be measured by the 'ability to give up approach', 'efficient resource use approach', 'ability to collect approach', and 'comparison with average performance or stochastic approach.

Economic Development

Tax Systems in Nigeria

Tax is dynamic in nature, and that is why a system of taxation varies from one country to another. 'In Africa, Nigeria like Algeria, Angola, Equatorial Guinea and Libya rely almost entirely on one single type of tax, unlike Kenya, South Africa and Mauritania which show a relatively balanced mix of different types of taxes'. Adeleke, (2011). Adeleke also summarised several authors that globally, there are only 24 of the world's 193 countries including four African countries namely Comoros, Nigeria, Ethiopia and South Africa with clear federal constitutions. Other country outside Africa that operates federal political systems includes America, Canada, Switzerland, Germany, Australia, India, Argentina, Brazil and Belgium. Iraq, Sudan, Sri Lanka and the Democratic Republic of Congo (DRC) are either considering the option or are in transition to a federal system.

According to Ariyo, (1997) the Nigerian tax system is basically structured as a tool for revenue collection. The need to tax personal income throughout the country prompted the Income Tax Management Act (ITMA) of 1961. In Nigeria, Personal Income Tax (PIT) for salaried employment is based on a 'pay-as-you-earn' (PAYE) system and several amendments have been

made to the 1961 ITMA Act. These policies were geared toward achieving effective protection for local industries, greater use of local raw materials, generating increased government revenue, among others (Mamud,2009). Tax administration, according to Barriyima and Gladson (2009) is carried out by various tax authorities as established under the relevant laws. Tax Authority according to section 100 of PIT Decree 1993 and amended by Decree No. 18- Finance (Miscellaneous Taxation Provisions) Decree 1998, means the Federal Board of Inland Revenue, the State Board of Internal Revenue or the Local Government Revenue Committee. Tax authority in addition to the Joint Tax Board, the Joint State Committee and the Body of Appeal Commissioners together constitute the organ of tax administration in Nigeria. The Federal Board of Inland Revenue (FBIR), through its operational arm, the Federal Inland Revenue Service (FIRS), deals with corporate bodies as well as Personal Income tax for certain categories of individuals, viz members of the armed forces, the Nigeria Police, residents of the Federal Capital Territory Abuja, External Affairs officials and non-resident individuals.

All taxes collected by FIRS goes to the Federal Government. The State Board of Internal Revenue through its operational arm, the State Inland Revenue Service, collects taxes from individuals and partnerships resident in the states. Taxes collected go to the State Government. The Local Government Revenue Committee collects specified rates, levies and fees from individuals and businesses located in the local government area. The Joint tax Board is the apex unifying tax authorities in Nigeria. Specifically, the problems common to and disputes arising among tax authorities are dealt with by this board which has been established among other things, to act as the adjudicating body.

Adeleke, (2011), analysed that over the last three decades, the sources of public revenue in Nigeria are proceeds from the sale of crude oil, taxes, levies, fines, tolls, penalties and charges. Oil revenues are the main source of public revenue, accounting for about 80% to 85% of the total (AfDB, UNECA, and OECD 2010). In the period 2001-09, oil revenues averaged 27% of GDP while tax revenues averaged 6.4%. Oil revenues have been volatile, ranging from 35.6% in 2001 to 19.6% in 2009 when oil prices dropped as a result of the global recession.

Akintoye and Tashie (2013) quoted Odusola (2006) further confirmed the analysis above in a study on The Effect of Tax Compliance on Economic Growth and Development in Nigeria, West-Africa that ‘over the past four decades, the country’s revenues were largely derived from primary products. Between 1960 and the early 1970s, revenue from agricultural products dominated, while revenue from other sources was considered as residual. Since the oil boom of 1973/4 to date, however, oil has dominated Nigeria’s revenue structure, and its share in federally collected revenue rose from 26.3% in 1970, to 81.8%, 72.6%, and 76.3% in 1979, 1989 and 1999 respectively. Over the past two decades, oil has accounted for at least 70% of the revenue, thus indicating that traditional tax revenue has never assumed a strong role in the country’s management of fiscal policy. Instead of transforming or diversifying the existing revenue base, fiscal management has merely transited from one primary product based revenue to another, making the economy susceptible to fluctuations of the international oil market.’ Nigeria focuses so much on the oil revenue while revenues from taxes are not given prime importance. As a result the development that Nigeria has witnessed till date does not commensurate with the revenue generated. From above, average oil revenue was 27% and tax revenue is 6.4%, a difference of 21%. However, if Nigeria could diversify and concentrate more on this aspect of their revenue, considering the population, it would go a long way in bringing desired development. The population of Nigeria is put at about 164 million out of which 92 million are

economically active, 51million are employed while 16 million are unemployed (IMF,NBS CBN, 2011) ; this if met with a good tax system where there is enough data base, transparent accountability, tax revenue would be more higher than oil revenue.

Akintoye and Tashie (2013) state that world over, tax is a major source of revenue but not every national government have been able to effectively exploit this great opportunity of revenue generation. In a Central Bank of Nigeria draft guidelines for electronic payments of all forms of taxes at all levels of government; tax was defined as ‘a compulsory levy imposed by a government on its citizens and used to run the government and finance projects’. The question that readily comes to mind is should revenue from taxes be used to run the government or to provide infrastructures and social amenities to the citizenry? This will make us examine what tax is and what tax is not.

What Tax is and what Tax is not

In defining a tax, it is better to look at its essential characteristics rather than its name (Ipaye, 2002). Government at all levels levied some sorts of charges, fine, penalties, fees and contributions on the populace for the purpose of providing certain services. Most of the times, the misconceptions on all these charges were that, and taxes were being paid. The questions now are:

Is any charge, fee or levy by government with the aims of providing commensurate services to the people a tax?

Is a voluntary contribution by the people encouraged by government at whatever level for the execution of a public project, a tax?

- a. While tax is a compulsory contribution backed by law, charges, fees, tolls, are not.
- b. While fines, penalties are levied as a punishment for crime committed, taxes are mere contributory aid to the government.
- c. While fees, fines, penalties and other categories of charges may be arbitrarily fixed, tax must pass through the process of law making in the state before it becomes a tax.
- d. While a payer can lay claim to a commensurate benefit from charges or fees contributed, a tax payer cannot claim a direct benefit from the government that is equivalent to the amount of tax paid (Nike, 2011).
- e. While a tax is a statutory collection which is not directed to the provision of a specific benefit, other charges by imposed for a particular service rendered (Ipaye2002).

The presence of the under listed characteristics/ features could be used to determine that an item is a tax.

- i. Compulsion: It is a compulsory contribution
- ii. Backed by law: it is backed by law
- iii. Fixed amount: it is a definite and fixed amount
- iv. Adult: It is levied on Adult
- v. Annually: It is paid annually
- vi. Not commensurate: The benefit is not directly commensurate with amount contributed.
- vii. Income & Asset: It is paid on income and Asset.

Therefore, no matter the name given to a charge, once it is compelled and statutorily backed by the law of the state, it is a tax. Tax means the same thing to everybody in every society but seen from different angles: to government, it is a source of revenue; to company it is a cost; and to individual, it is a depletion of their income” (Agbetunde, 2004). “Tax; the imposition of compulsory sums of money by the government or its agencies on individuals and firms, the

collection of and the accounting for the levied amounts and the keeping and auditing of tax records" (Anyanwuocha, 1993). In Akintoye and Tashie (2013) tax is a compulsory levy imposed on a subject or upon his property by the government to provide security, social amenities and create conditions for the economic wellbeing of the society. Anyanwu (1997) stated that tax are imposed to regulate the production of certain goods and services, protection of infant industries, control business and curb inflation, reduce income inequalities etc. The main purpose of tax is to raise revenue to meet government expenditure and to redistribute wealth and management of the economy (Ola, 2001; Jhingan, 2004; Bhartia, 2009). Oxford English Dictionary defines a tax as "a compulsory contribution to the support of government levied on persons, property, income, commodities, transactions etc now at a fixed rate mostly proportionate to the amount on which the contribution is levied". A tax is a compulsory levy on individuals and business organization which the object of financing government expenditure (Ilemobayo, 1997). It is paid „quid pro qui" i.e. without expecting something specific in return. "Alternatively, a tax may be defined as a liability imposed upon the tax assesses who may be individuals, groups of individuals, or other legal entities. It is a liability to pay an amount on account of the fact that the tax assesses have income of a minimum amount and from certain specified sources or that they own certain tangible or intangible property, or that they carry on certain economic activities which have been chosen for taxation" (Bhatia, 1976). Taxation on the other hand is the process of improving, assessing and collecting taxes (Agbetunde, 2004)

Evolution of Taxation in Nigeria

Taxation is one of the oldest social economic concepts. "The history of man has shown that man from origin, had to pay tax in one form or the other, in cash or in kind, initially to his Chieftain and later on to a form of organized government. The people of the Niger Area, a terminology used to describe present day Nigeria with its diverse people and culture were not insulated from such traditional pre-colonial tax system" (Dada, 2007). Olusanya et al. looked at the tax system in Nigeria under three periods viz: pre-colonial, colonial and post-colonial periods.

Pre-Colonial Period in Nigeria

"Before the advent of the British to West Africa, there were Empires, Kingdom and Emirates governed by the Obas, chiefs, Emirs and Sultans, They governed, administered, executed communal projects, provided securities and at times went into wars. All these were financed by the provisions from the people ruled either voluntarily or compulsorily. As such each empire or kingdom had a form of taxation in place, however primitive it was (Agbetunde, 2004). Agbetunde reviewed what obtained in this period by looking at Western, Northern and Eastern parts of Nigeria.

Taxation in the Western Region in Nigeria

There are documented evidences in the records of the British Colonialists on taxation in the Southern province consisting of Western and Eastern Regions. In these records it is appreciated that there were developed systems of taxation in Oyo and Benin Empires. It is on record that the Manor House, a Government VIP Rest House at Iseyin was built between 1916 and 1932 by community effort. Building of walls round the towns in Yoruba land to prevent external aggressions in the then Oyo Empire. These projects were all executed through what is called 'Owe', Others are tributes which were common among the Oyo, Egba and Benins. The Ijebus and Ondos derived most of their taxes from levies and tolls on traders and farm producers (Agbetunde, 2004).

These taxes were imposed by laws, custom and traditions. Rates were fixed by the Obas and the time of payment was usually in the time farm produces were harvested. There were -structured machinery established for collection and refusal to pay or payment below expectation is usually penalized (Agbetunde, 2004),

Taxation in the Eastern Region In Nigeria

Taxation in the East was the least developed of all the parts of the country, -This is due to the customs and traditions of Igbos, The Igbos lived in community of small families and in most instances without a constituted authority. Due to this structure, the Aba Women Riot of 1929 was not a surprise (Agbetunde, 2004).

Taxation in the Northern Region In Nigeria

"There existed in the Northern Region an efficient and stable administration based on Islamic system. Uthman Dan Fodio established an Islamic system of government that was adopted by his successors. Under this system of government there existed a central authority at Sokoto with Emirs as governors in other cities and towns under the caliphate. They were all subject to the ruling of the central authority and the adopted state religion was Islam, Under the Islamic religion, it is an obligatory religious duty to pay tax by all members of the society. This tax is the fourth in the hierarchy of five pillars of Islam" (Agbetunde, 2004).

Since the attainment of full federal Status and independence, there has been various evolutionary tax enactment and proclamations with a number of amendments. This has recently left the country with the following statutory tax laws.

Nigerian Tax Laws

The major framework regulating the collection of taxes in Nigeria is as follows:

1. Personal Income Tax Act No. 104 laws of the federation of Nigeria (FGN) 1993. This is the law that provides the rules and practices of Personal Income Taxation in Nigeria.
2. Companies Income Tax Act Cap 60 LFN 1990. This is the current enabling law that governs the collection of taxes on profits made by companies engaged in petroleum exploration activities.
3. Petroleum Profit Tax Act Cap. 354 LFN 1990. This is the law that regulates the collection of tax on profits made by companies engaged in petroleum exploration activities in Nigeria.
4. Capital Gains Tax Act Cap. 42 LFN 1990. This law which amended the Capital Gains Tax Decree No. 42 of 1967 governs the collection of taxes due on the disposal of chargeable assets.
5. Value Added Tax Act No. 102 LFN 1993. This law regulates the collection of tax due on 'vatable' goods or services.
6. Education Tax Act No. 7 LFN 1993. This tax law was promulgated in 1993 with the sole objective of enabling the government to use the amount collected for rehabilitation, restoration and consolidation of education in Nigeria.
7. Industrial Development (Income Tax Relief) Act Cap 179 1990. This the enabling law that grants tax holidays to certain categories of companies designated as pioneer companies.

Tax Administration in Nigeria

Fasoto (2008) in his paper presentation on the topic "general overview of tax administration" at the 2008 Stakeholders' conference for Professional Associations (17th April, 2008), explained

tax administration and the institutional arrangements involved in tax administration in Nigeria. However, tax administration refers to the management and control of the whole gamut of the system by the government. (Fasoto, 2008), According to him, Tax administration is a foundation for effective revenue generation by any government. In his words "the strength of a tax system, lies in its effective administration". In Nigeria, the responsibility for the administration of the taxes is entrusted to the Federal Inland Revenue Service and the State Internal Revenue Service, The service appoints inspectors who carry out the work of assessment for Income Tax, Education Tax, Capital Gains Tax, Value Added Tax (VAT), and Banks who collect these taxes on their behalf (Fasoto, 2008).

Theories of Taxation

Bhartia (2009), a taxation theory may be derived on the assumption that there need not be any relationship between tax paid and benefits received from state activities. In this group, there are two theories, namely, Socio-political theory and the expediency theory.

Table 1: **Summary of Theories of Taxation**

Theory	Assumption	Source
Socio political theory	This theory of taxation states that social and political objectives should be the major factors in selecting taxes. The theory advocated that a tax system should not be designed to serve individuals, but should be used to cure the ills of society as a whole.	(Bhartia, 2009). Anyanfo (1996) in Ogbonna and Ebimobowei (2012)
Expediency Theory	This theory asserts that every tax proposal must pass the test of practicality. It must be the only consideration weighing with the authorities in choosing a tax proposal. Economic and social objectives of the state as also the effects of a tax system should be treated irrelevant	(Bhartia, 2009). Anyanfo (1996) in Ogbonna and Ebimobowei (2012)
Benefit Received Theory	theory proceeds on the assumption that there is basically an exchange relationship between tax-payers and the state. The state provides certain goods and services to the members of the society and they contribute to the cost of these supplies in proportion to the benefits received	(Bhartia, 2009). Anyanfo (1996) in Ogbonna and Ebimobowei (2012)
Cost of Service Theory	emphasizes the semi commercial relationship between the state and the citizens to a greater extent. In this theory, the state is being asked to give up basic protective and welfare functions. It is to scrupulously recover the cost of the services and therefore this theory implies a balanced budget policy.	(Bhartia, 2009). Anyanfo (1996) in Ogbonna and Ebimobowei (2012)

Faculty Theory	theory states that one should be taxed according to the ability to pay. It is simply an attempt to maximize an explicit value judgment about the distributive effects of taxes.	Anyanfo (1996) (Bhartia, 2009) in Ogbonna and Ebimobowei (2012)
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Relationship between tax and economic development

Role of Tax in Economic Development

Taxation is not only an effective tool to reduce Nigeria's dependence on oil revenue but also dependence on aid from developing partners. With a population of about 150 million people, Nigeria has tremendous tax potentials that can guarantee reliable and uninterrupted revenue to government. Efficient and robust taxation system is the cornerstone to attaining the Nigeria's ambition of becoming one of the most rapidly developing economies in the world by 2020. (Adeleke, 2011). No matter the nature of the type of government a country practices, it is clear that government clearly identifies its sources of revenue and how to allocate mobilized funds to various expenditure centres and projects that will positively impact on the lives of its people (Shah and Shah, 2006; Ola and Offiong, 1999).

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Information and Communication Technology for Urban Development: A Gender Perspective

By

Carolyne Adhiambo Kokeyo* & John Oluoch**

Abstract

Information and Communication Technology for urban development is based on the premise that technologies have the potential to fulfil human desire for progress thus, improved livelihoods. The implication is that people appropriate technology for self fulfilment. The exploit of technology is certainly transforming the world. However, there is a problem in understanding ICT for development within the confines of technology alone without assessing how it impacts on different gender. It is easy to lose sight when we merely change the world without really understanding it. This is because technology is embedded in a social context. Hence, the concern that, in making use of factors of production such as technology, the digital divide between technology poor and technology rich is proliferating. This probably explains the current digital divide debate and its profusion in communication studies. However, little is known about digital gender inequalities that are perpetuated by ICTD in developing countries. Hence, this paper hopes to fill this gap by highlighting the benefits accrued to accessing and using ICT by the urban populace in Migori town while addressing the impact it may have on different gender. Additionally, it is the argument in this paper that gender responsive ICT can be a panacea for narrowing the digital divide between the technology haves and have not by addressing concerns of different gender with regard to access and use of ICT.

Keywords; communication studies, Information, Communication, Technology, Development

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Introduction

The notion that Information and Communication Technology (ICT) can trigger economic and political development while immensely affecting social structures abounds in communication studies (Chapman and Slaymaker, 2002; DOTForce, 2002; Hafkin and Taggart, 2001; Heeks, 2009; World Bank, 2006; Melhem, Morell & Tandon, 2009). The International Labour Organization joins this debate with the view that ICT is a global job creator (ILO, 2001). This explains the realization among developing countries that unless the technology poor have a chance to catch up with the increased advancement of the technology rich in the developed nations, the already existing economic gap between technological "have" and "have not" will be perpetuated further (Bridges, 2001). To this effect, the United Nations promote ICT for development as a means through which this digital divide can be lessened (Bridges, 2001; UNDP 2001; World Bank, 1999; TDG, 2000). The aforesaid has made useful contributions to ICTD studies. However, what is not known about the digital divide theory is the view that different genders have different concerns in accessing and using ICT. There is, therefore, the need to highlight how the digital divide is impacting on different gender in socio-economic development as this may further perpetuate the already existing digital divide.

This discussion is driven by the numerous efforts by many countries of the world, Kenya included, to establish organizations to promote ICT (Morgan, 2012). The efforts range from developing skills for use in the labour-force to ensuring adequate access to technology (ibid.). The simple reason being that ICT is a driving force for development, and so, imbedded in Kenya's vision 2030. With the help of ICT, Kenya aims at being the hub of Business Process Outsourcing in Africa. This is to transform Kenya into a middle level economy (GOK, 2007). This vision is to be steered by both men and women in Kenya. However, it is easy to remain preoccupied with the benefits of technology without realizing that very little is known about how access and use may affect our social lives as a developing country. More, the existent digital divide among different gender and what impact this may have on socio-economic development is left unexplored. Hence, this paper hopes to fill this gap. The benefits accrued to accessing and using ICT by the urban populace will be highlighted while looking closely at how it may impact on different gender.

Information and Communication Technology for Urban development

Information and Communication Technology (ICT) has been defined variously by different scholars. According to Slaymaker and Chapman (2002), ICTs include an array of communication equipment or technologies used in processing and communicating information. It encompasses computer technology, multi-media and network hardware and software, telecommunications and opto-electronics [semi-conductors and fibre optics]. It covers any technological products and processes that store, retrieve, manipulate, transmit or receive unprecedented amounts of information and communicate electronically in a digital form. They are satellites, mobile telephones, wireless local loops and also, a range of applications such as internet, email, distance or open learning, teleworking, digital radio and video.

With the invention of wireless technology, ICT can be accessed almost anywhere. Physical access to ICT occurs in public spaces such as workplaces, libraries, schools as well as community information centres. In Migori County, for instance, ICT can be accessed through mobile phones, privately owned cyber-cafes as well as satellite systems famously known as ZUKU. Even so, not everyone can afford to pay for these services as result of their cost.

ICT, as addressed in this paper, refers to access and use of the internet enabled computers and mobile phones, cybercafés and satellite systems. Additionally, the term urban refers to proliferation of shops, supermarkets and markets into a town or city. Gender as a strategy recognises that development initiatives such as policies, programmes, projects or activities are never neutral and that they can actually widen the gaps between individuals and groups (Morgan, 2012). Hence, every initiative, regardless of the sector of intervention or discipline involved, has different effects and impacts on men and women, young people and older people, rural and urban populations. It is for this reason that, as a developmental approach, gender is understood to mean men and women's needs for empowerment and equality, that is, the Gender and Development (GAD) approach (Reeves & Baden, 2000).

From the foregoing definitions, Information and Communication Technology for urban development (ICTD) refers to women and men of the urban populace accessing and using ICT as a tool for accelerating social-economic outcomes in the domain of transport, health, education and trade for the purpose of improving their livelihoods and quality of life. ICTD is based on the premise that technologies improve livelihoods. Research has shown that technology has the potential to fulfil a people's desire for progress (Brewer et al. 2005). Scholars support this view with an explanation that those with higher usage of ICTs will be advantaged in education, income and other resources as these contribute to improved livelihoods (Hoffman & Novak, 1998:1999; Benton foundation, 1998; Strover 1999; Bucy cited in Neckerman, 2004). This position implies that people appropriate technology for self fulfilment hence, social modernization. This can be traced back to the times of industrial revolution (1770-1850) in which work was made easier by means of water power giving rise to mechanization.

Steam powered technology followed closely between the years 1850-1900 which then saw electrification of 1900-1940. In the event of continued modernization arose motorization and automated society of 1940-1970 then to the most recent digitization of the society. Indeed humans have struggled to improve their livelihoods through technology. However, in making use of factors of production such as technology, our social stratum has changed as well. Evidently so is the proliferation of the digital divide between the technology poor and technology rich. Consequently, there is the problem of understanding ICT for development within the confines of technology alone and not assessing how it impacts on different genders. This has been put forward by Heeks (2007:1) that "...there has been a bias to action, not a bias to knowledge. We are changing the world without interpreting or understanding it". This implies the need for an understanding of ICTD within other factors such as community development, poverty, agriculture, health care, education among others. Further, it explains why probably most governments of any country tend to fuse ICT with other disciplines. However, little is known about digital gender inequalities that are perpetuated by ICTD. It is therefore the argument in this paper that gender responsive ICTs can be a panacea for narrowing the digital divide between the haves and have not by addressing issues of access and use of ICT by different gender.

ICT in Urban Areas

ICT can open up new avenues and offer new opportunities to support economic development of the urban livelihoods. If accessed and used, ICT can strengthen production and increase market coordination which are the main processes that can contribute to future opportunity and creation of income. Chapman, Slaymarker and Young (2004) have observed that ICT influences livelihoods in a number of ways depending on the context in which ICT is delivered. The

provision of ICT through cybercafes and telecentres in the urban areas can improve livelihoods in the following ways:

Financial capital: This is where online and mobile banking famously known as e-banking or M-banking allows the urban populace to have greater access to banking facilities and can provide a secure place for cash deposits and remittances. For instance, in Migori town, Equity and Cooperative banks partner with entrepreneurs by situating outlets within business premises through mobile-banking. Additionally, smartcards, automated teller machines, M-Pesa, M-Shwari are used to access loan facilities as withdrawal and banking of cash is made possible through e-banking. E learning, participatory approaches such as micro-finance institutions and networking across political and cultural divides as well as sharing best practices is made possible through mobile phones as well as cyber cafes.

Human capital: This is where the use of ICT allows computer trainers to impart updated knowledge and skills, techniques and new developments in technology to the urban populace through computer training. In Migori, most cybercafes house computer training at a fee. Migori town is situated in a valley making it impossible to access frequencies without the assistance of a satellite receiver. Nevertheless, the advent of ZUKU satellite has made access to local and global information sources possible. Additionally, with the dawn of devolved government in Kenya, job applications at the counties have been made easier through on line applications.

Physical capital: Service providers like Safaricom, Orange, Airtel, ZUKU, DSTV monitor access to services through ICT in Migori town. ICT service providers can also detect network problems with minimum inconvenience their customers. Further, these services are accessed and paid for through M-Pesa, hence saves time. **Natural capital:** This is where access to information about availability and management of natural resources is enhanced. For instance, in Migori town, gold mine entrepreneurs and other traders can access market prices with the help of their internet enabled mobile phones as well as cybercafés thereby averting exploitation by middle men.

Social capital: This allows for social networking. ICT bridges time and space [the case of banking while in one's living room] ends isolation in social media and enables one to access knowledge and productive resources either through mobile phones or computers. In Migori, those who access face book are able to get in touch with what is going on in the county through friends and network partners.

Gender Issues in ICT for Urban Development

Despite numerous benefits accrued to access and use of ICT, many women are not yet ICT compliant as compared to their male counterparts and so may be left out in terms of development. Scholars have pointed out that a people's relationship with technologies, such as ICT, determines their use and access. Wajcman (1991:28) posits that "though new technologies do represent a force for change ... the outcomes are constrained by the pre-existing organization of work, of which gender is an integral part". Implying that one's relationship with technology is dependent on whether one's needs and concerns are considered and whether what one needs is made available. In Hafkin's(2002) words, 'one cannot use what is not available' but even when it is availed, the existence of ICT in public spheres does not guarantee access to and use by all. In the same vein Wambui (2002) adds that the constraints to effective use of ICTs in developing countries are a mirror of the already embedded gender relations in the society where women are socialised into non-technical careers and made to distant themselves from software production.

However, Chapman and Slaymaker, (2002) refute this when they mention that women need to move beyond being merely users of technology to being producers of technology.

From the above discussion, Wambui's observation may be seen to have been skewed to developing countries, particularly Africa. However, in India, the reverse is true because women have made careers in the ICT sector. Furthermore, other parts of the world have noted high women representation in software production and use (Wright and Jacobs, 1994). Rickert, Anne and Sacharow, (2000) support this when they mention that, currently, more than 50% of the internet users in the west are women. Even so, men are still advantaged in creating and controlling what goes on in the media given their roles as technocrats (Herring, forthcoming). Hence, there are still disparities of ICT production by women as compared to men. This is confirmed by Wood (2001) who asserts that:

ICT usage represents a social reality [...] Addressing these realities (including gender imbalances) creates a space for social justice [...] We need to ask: Who controls the mouse?' (Wood 2001 in Hafkin, 2002 p.4)

The implication here is that access and use should be embedded in the production that is aligned to one's needs for technology. If this is not addressed then the gap will still widen. With this regard United Nations posits that ICT thirs poverty and violence against women viz a viz global issues facing women (Hafkin & Taggart, 2001). To highlight this are the statistical reports on gender issues:

Global Gender Issues

The Wold's Women Report [WWR] (2010) stipulates that women perform 2/3 of the world's working hours and produce over 50% of its food but only earn 10% of its income, own less than 2% of its property and receive less than 5% of all bank loans. Additionally, of the 1.2 billion people living in poverty [earn less than \$1 a day], 70% are women. In the space of 20 years, the number of rural women living in absolute poverty has increased by 50%, compared with 30% for men. No country has achieved wage equality and 60% of workers in precarious jobs are women. Around 16% of the adult population is illiterate: 2/3 of these are women. 72 million school-age children are not in school: 54% are girls. Of the world's 40 million refugees, 75% are women and children. One in three women has been raped, beaten or suffered some form of abuse at least once in her life.

Gender Issues in Africa

The Wold's Women Report[WWR] (2010) has also observed that despite restrictions on their rights to own, use and inherit land (in 43 out of 48 countries in Africa, land law is characterised by inequalities in land acquisition and ownership), women own just 1% of land and are responsible for over 60% of food production. Women have access to only 10% of the credit granted to small farmers and to 1% of the credit awarded to the agricultural sector. A woman's working day is 50% longer than a man's. In Sub-Saharan Africa, 47% of men are literate compared with 30% of women. Research has shown that if women had equal access to farm income, agricultural services and land and if they controlled these resources and their benefits, production could increase significantly (Moser, 1993; 1996). It is estimated that women's limited access to education and employment reduces annual growth rates by 0.8%. HIV-positive women in Africa account for 58% of all documented cases, and many of these are rural women. In Sub-Saharan Africa, 61% of adults living with HIV/AIDS are women; 75% of 15-24 year olds newly infected with HIV are girls and women.

The Digital Gender Issues

From the foregoing discussion, it is evident that there exist a gender gap and this may be a bottleneck to development. This gap is perpetuated further by a number of digital gender issues: First is the stereotype pegged on the notion that science, math and technology are predominantly a male preserve while girls and women strive more in languages (Quaisie, 1996). This has contributed to some females shunning the use of technology. The famous phrase 'this thing is not for us' by women further perpetuates this stereotype. However, there is need for the female gender to rise above the techno phobic theory by enrolling for math, science and technology courses. This is slowly being realized in America, Europe, Asia and the Pacific, and Russia. In these countries girls, as early as primary level of education, are encouraged to deconstruct this theory by making a career out of ICT (ITU, 2001 in Hafkin, 2002). Additionally, if access and use is availed, another study has shown that women actually embrace digital technology even more than men, disproving the stereotype of "technophobic women"(ibid.).

Second are issues of income, education and employment. Going by the Wold's Women Report[WWR] (2010) that 2/3 of the world's illiterate are women and this is unlikely to improve in the near future (UN,2000) , the inference is that 2/3 of these illiterate women will not embrace ICT. The reason being, that the digital language that has been used in the past has been predominantly English with Chinese, Japanese, German and Swahili being included only recently. It may be argued that, with translation, the problem would be resolved. However, translation alone would not help if one cannot read and write. Hence, as Hafkin (2000) has suggested a solution to this would be to use translation alongside graphic and voice user interfaces for those who are illiterate.

In other words, with issues facing women [as indicated by WWR 2010] limited access and use of ICT by women may be as a result of their unfavourable conditions with respect to employment, education and income. It is, therefore, believed that if these variables were to be controlled, women would turn out to be more active users in ICT than men (ITU, 2001). This turns the alleged digital gender divide into a debate that, if ICT were to be gender responsive, it would be the panacea for treating this digital gender divide by offering women opportunities and the potential to provide access to employment, education, income, health services, participation, protection, and as well as safety (Heeks, 2009). That is to say that ICT would give women a voice to tackle social discrimination as they make use of this opportunity to fight longstanding inequalities existent in the society. Research shows that there is need for the female gender to embrace ICT given their roles in driving social and economic growth (Slaymaker & Young, 2002). A study conducted by ITU 2001 indicates that bridging the digital gender divide in the workplace drives economic growth while struggling to maintain the status quo cost billions of dollars in a year.

Migori Town

Migori, the capital of Migori County is located 63 km south of Kisii and 22 km north of the Tanzania border. The town has an urban population of 31,644 and total population of 46,576 (1999 census) and is connected to a road leading to Maasai Mara national park. Migori town is immediately after Awendo, (where the Sony Sugar Company is situated), Oyani, Stella and Kakrao areas. After Migori town is the road to Isebania which leads to Mwanza in Tanzania. The latitude and longitude are 1,0667 and 34, 466 respectively while the altitude is roughly 1323 meters at Kakrao descending by 100 metres into the Migori river. The different peaks near the

town are a little over 1550 metres above sea level. This explains why the frequency can only be accessed through satellite.

The soils are well drained and tending to loamy hence favours the cultivation of tobacco, sugarcane, maize, beans, coffee, groundnuts and vegetables. The major economic activities are mining and trade. Mining is centered in Macalder area of Migori on the way to Sori (Karungu Bay). However, most economic activity is centered on the main highway that crosses the town. Apart from mining there are other small and micro enterprises largely the Jua Kali with a concentration in auto mechanics, furniture works, tailoring, welding, trade and agriculture. Agricultural produce comes from surrounding areas like Ngege, Oyani, Anjogo etc. Other profit making organisations include Barclays, KCB, K-rep, Diamond Trust bank, Kenya Women Trust bank, Family Finance, Co-operative, National and Post banks. Additionally, there is a National cereals board depot. Migori town is chosen because it is the capital of Migori County as well as a typical representative of other towns found within the county.

Gender Issues in the Context of Migori Town

Other than playing different roles in the society, women and men in Migori town have different concerns in accessing and using ICT. These concerns, which Morser (1993:38) refers to as 'gender needs', are categorized into two domains: those that are needed for survival as identified by women within a specific context [practical gender needs] and those that challenge male dominance [strategic gender needs]. The author argues that in addressing gender issues in developing countries, prioritizing these concerns is of importance. Many of these concerns to some extent depend on one's behaviour but in most cases are pegged on one's cultural and societal orientations which then influence women's needs economically as well as politically. Culturally and even socially, most women, especially in developing countries, are often impeded from access to and use of ICT (Hafkin, 2000). These, in the end, limit their opportunity to develop economically. More, genders issues are rarely infused in ICT policy. This paper discusses gender issues using two lenses: access and use.

Based on the aforementioned, there are cultural issues, more so in Africa, that impede women from accessing ICT (UNIFEM & UNU/TECH, 2000). For instance, infrastructure can be termed as a gender issue if analyzed in relation to location, cost and choice. This is because most infrastructure and high technology applications are found within the town centres while a majority of women live in the rural areas. More, given women's roles as caregivers [taking care of children and the elderly] in the home, it is difficult for most of them to move to urban areas. This implies that most women may not access communication infrastructure. Hafkin (2001) is of the opinion that the deployment of infrastructure ought to be concentrated where women may predominate.

In terms of income almost all communication facilities are costly. For instance in Migori town, the cheapest mobile phone ranges from 1000-2000 Kenya shillings. However, these cheap mobile phones are not internet enabled while those that permit internet access are costly approximating 4000-15000 Kenya shillings. Yet, in context, most women are dependent on men for their economic needs. Nonetheless, even when they do have access to these resources their income is controlled by men. Further, research has shown that women spend 70% of their income in meeting the family's basic need in subsistence economies (Jacobson, 2007) and so would probably hesitate to spend their income on ICT. This implies that with less income, some women may not access ICT and so may not contribute to socio-economic development. There is,

therefore, the need to lower costs and introduce regional tariffs to mitigate the bias (Hafkin, 2002). More, the continued insistence on standards like we saw last year in Kenya [in which most Chinese phones which permit access to the internet were banned] may mean that cheap mobile phones may soon be out of the market and so most women and men with low income will not have access to them. Hafkin, (2007) insists that there is need to analyze who needs ICT and for what purpose in the event that choices are made. It is also vital that user-friendly technology be supported especially for those who are illiterate.

In terms of location, most cybercafés, like those in Migori town, are centered on the main highway [Migori-Isebania] that crosses the town. More, users of these cybercafés are predominantly young male adults who frequent these facilities for several reasons; among them being to watch pornography. It is therefore difficult for girls and women who are expected to be prudent to visit these cafes for the fear of being mistaken. A typical example is one cybercafé owned by a Christian. The cybercafé is located behind the shops along Migori-Isebania road. Given its location and because it allows for privacy, it is mostly visited by middle aged male and female adults. However, culturally, frequent visit to these kind of cybers by women may not be welcomed as the public domain is a male preserve. Hence, women's mobility in the public domain is restricted. There is, therefore, the need for internet content regulation to mitigate this prejudice alongside awareness advocacy in planning and implementing infrastructure (Hafkin, 2002).

Lastly, most cybercafés are located in the town centre of Migori. However, based on my experience, given women's responsibilities as caregivers alongside work or business, their leisure hours are limited. What this means is that by the time these women complete their chores, most of these cybercafés have closed down. Nevertheless, even when they are open, culturally, evenings is a male preserve since women are expected to be at home to prepare dinner. Additionally, it may not be safe for them at these 'odd hours'. There is, therefore, the need to adopt schedules that suit women's needs. Further, bringing more female trainers on board to work with fellow women may mitigate cultural issues that may hinder them from enrolling for IT courses (Chapman & Slaymaker, 2002). More, training of women technologists would enable them to contribute favourably and equally with their male counterparts in contributing towards socio-economic development.

Conclusion

This paper has attempted to highlight the benefits accrued to accessing and using ICT by the urban populace while addressing the impact it may have on different gender. The problem of a narrow understanding of ICT for development within the confines of technology is discussed. Further, the issue of proliferation of the digital divide has been addressed with the view that ignoring the impact of ICT for urban development on different gender may lock the developing world into a digital gender divide. It is argued that insistence on the status quo may be a costly affair. Hence the conclusion that gender responsive ICT can be a panacea for narrowing the digital divide between the technology haves and have not, consequently, improved socio-economic development.

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Internet usage in non-fiction writing: opportunities and challenges/threats

By

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Abstract

This study assessed the opportunities and challenges that have been brought about by the advent of the Internet services. Since the study was all about the perceptions held by researchers on Internet usage, the descriptive survey design was adopted. Questionnaires and interviews were used to solicit data from the respondents. Data were reported both qualitatively and quantitatively. The study focused on the 130 tutors at the Zimbabwe Open University's 10 geographical regions. Out of this population, a convenient sample of 50 was selected. The study found out that the respondents showed enthusiasm towards use of Internet for various purposes including research and scholarship work. It also established that the Internet was used for research for publication purposes by a sizeable number of the lecturers but the majority of the lecturers used the Internet for research for scholarship work. Though respondents showed a positive attitude towards the use of the Internet, the impact of this use was not being translated into tangible results as only 23 research articles and 4 books had been published among the 50 lecturers over a period of three years. Lack of competence in internet usage and lack of access to blocked but vital documents made it difficult for the faculty members to use the internet. It was therefore recommended that there should be intensive training in Internet usage particularly searching for information from various sources. Though expensive, lecturers are encouraged to purchase USB internet modems for connectivity where the institution is unable to provide connectivity.

Key words: Internet, non-fiction, opportunities, geographical regions, descriptive survey

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Introduction

The use of the Internet research has become a significant area of concern as the use of this research platform has increased. The Internet has been adopted for use in various works, both fiction and non-fiction. For Markham (2000), Internet research has focused on 'virtual ethnography. As for Herring (1996) and Sharf (1999), among others, Internet research has focused on linguistic and discourse based analyses of computer-mediated communication. Despite hiccups, the Internet has been adopted at the Zimbabwe Open for a wide variety of uses ranging from social networking to research and scholarship work. It is the extent to which the lecturers have embraced the Internet in research that is of interest to the present research. The study explores the usage of the internet in the various categories of uses and examines the benefits that have been achieved through the use of the Internet as a platform for the various uses. According to the World Bank, the use of ICTs has been dogged by numerous impediments among which are the lack the capacity in financing the ICTs for use in education and the unavailability of manpower to staff develop others in the use of these ICTs. The study therefore goes further to investigate the challenges that lecturers at the Zimbabwe Open University face in the use of this most invaluable platform as they go about their various daily routines more so in their research studies.

Background to the study

The Zimbabwe Open University (ZOU) is the only state Open and Distance Learning (ODL) institution in Zimbabwe, established on 1st March 1999 through an Act of Parliament (Chapter 25:20). Currently, in 2012, ZOU has four faculties; the Faculty of Arts and Education, the Faculty of Science and Technology, the Faculty of Commerce and Law and the Faculty of Applied Social Sciences, offering over 60 diploma and degree programmes. Students are drawn from the country's ten geo-political provinces as well as the Virtual Region encompassing students outside the country, wherever they may be in the world.

It is at this institution where the advent of the Internet as part of Information Communication Technology has brought with it relief to lecturers as they attempt to transform themselves into world acclaimed non-fiction writers. All the ten geo-political regions of the university has hooked to the net and some of the benefits from the look of it would appear to that source documents are provided for in soft copy form not laborious to peruse and these are expeditiously obtained by logging on into the Internet. On the net, the lecturers are confronted with numerous documents for use as reference material. However, though the Internet has been widely used in a wide range of educational and socio-economic activities, not all has been rosy in the use of the facility, and lecturers at the ZOU have not been spared. Hence this study was aimed at unearthing some of the benefits and challenges in the use of the Internet facility at the ZOU as some writers very often have found themselves abstaining from the use of the Internet for one reason or the other.

Statement of the problem

Limited access to up to date materials in libraries of universities in developing countries is a main problem that impedes research and teaching but with the advent of the Internet, situation is a blessing for non-fiction writers. However, with the Internet facility at the infancy, what are opportunities and challenges that go with the facility among researchers at the Zimbabwe Open University?

Research questions

The current study aimed at addressing the following research question:

1. What are uses to which the Internet is being put by non-fiction writers?
2. To what extent has the Internet positively impacted on the non-fiction writing activities among lecturers?
3. What are the challenges confronting the lecturers in the use of the Internet at ZOU in the 10 regional Centres?
4. How best can the challenges confronting the lecturers be alleviated?

Literature review

Internet usage and its impact in various academic activities

The Internet is a world-wide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without regard for geographic location. It is a computer network made up of thousands of computers and networks world-wide. It is an information superhighway that provides unlimited access to a wealth of information on different topics contributed by people throughout the world (Griffith, 2002; Scholastic, 2003; University Libraries, 2003). Every personal computer, cell phone or other device that people use to look at web sites is also a part of the Internet.

The Internet also makes possible email, games and other applications unrelated to the World Wide Web. No one knows exactly how many computers are connected to the Internet (Bull, Bull and Sigmon, 1996). However, Bull, Bull and Sigmon (1996) argue that while the Internet is a powerful and expanding educational medium, there are times when another medium may be more educationally appropriate. Even if you have access to the Internet, web materials that have been transferred to a CD-ROM can be useful for the following reasons: high speed delivery of graphics; no online connection charges and materials can be used even when there are no Internet connections (Bukaliya and Dzimano, 2011)

According to Savolainen (1999), the Internet provides access to unlimited sources of information and search engines is continuously being advanced to provide efficient ways to help users to find what they want. The Internet eases and increases access to a large amount of data, saves time and money, and obtains an opportunity to consult several experts with a single request (via discussion groups), and greater independence from specific times and places for information seeking

In Pakistan, Internet has been used effectively in academic institutions and libraries and it is creating an environment that is continuously changing (Bhatti, 2000). This has made the teaching and research functions of faculty members more challenging. According to Bhatti (2000), the important features that have affected the quality of information are accuracy, currency, comprehensiveness and time. Al-Ansari (2006) argues that the Internet is mostly used for communication, research, and publication by saving time, find up to date information, and cooperate with their colleagues.

Challenges in the use of Internet facilities by researchers in institutions

Aduwa-Ogiegbaen and Uwameiye (2006) established that in some counties, government opposition to ICT has been a major factor in limiting Internet access. According to Ghashghai

and Lewis (2005), many Middle Eastern leaders view the Internet as a Western-based agent of moral and political subversion. As a result, many countries strictly enforce limits on Internet connectivity. In Egypt and Jordan have been relatively progressive in building Internet connections but countries such as Saudi Arabia have restricted widespread access to the Internet. Internet access is very limited in Syria, and Libya and Iraq prohibit any kind of Internet access. Bahrain and Tunisia openly monitor Internet traffic, and the United Arab Emirates and Yemen use proxy servers that can prevent users from accessing “undesirable” sites. Iran allows access, but the extent of the traffic monitoring in that country is uncertain (Alterman, 2000).

Aduwa-Ogiegbaen and Uwameiye (2006) argue that the lack of access to information technology and its requisite skills contributes to an inability to compete in the mainstream economy and mobility to participate meaningfully to civil society. Furthermore, Aduwa-Ogiegbaen and Uwameiye (2006) assert that lack of access to information technology impedes success in academic pursuit, the skills necessary to work in knowledge driven society, and ability to prosper in modern society.

According to Adika (2003) challenges to internet usage include lack of access to the Internet and lack of training in internet usage. Al-Ansari (2006) argues that despite the Internet being mostly used for communication slow speed, lack of time, and lack of access from home are the major problems confronting faculty in the use of the Internet. Bhatti (2006) ascribes the challenges in the use of the Internet to shortage of computers and slow speed of Internet and the shortage of e-books and subscription to e-journals is expensive. Lack of time and inadequate knowledge about information retrieving techniques from Internet was found to be the problem for some faculty members.

Internet competency and access among users

A research by Bukaliya and Dzimano (2011) established that 83% of the full time lecturers at ZOU had 3G internet connectivity and, despite being off line most of the time, all lecturers had access to the library Dialup internet connection. However, the availability of and access to the internet gadgets and being connected, does not necessarily mean competence and usage. Several other researchers have established that having access to ICT and using it in any process are a challenge since the ICT smacks of more problems than solutions (Olaofe, 2005; Kangai and Bukaliya, 2010).

Another interesting finding from the same study was that contrary to the findings by Agbatogun (2006), the young breed of lecturers at the Zimbabwe Open University did not access the web/internet more than their elderly lecturers. It would have been expected that this young generation play a leading role in web/internet usage as is the trend when it comes to playing games on the computer.

The relevance of e-books and resources available to the researchers

Meier (2000) notes that the Internet becomes very useful given the limited access to up to date materials in libraries of universities in developing countries is a main problem that impedes research and teaching. According to Adika (2003), interlibrary loans and document delivery projects have been inadequate to resolve this problem by themselves and the Internet has made it possible for users to have access to large volumes of information irrespective of their geographical location. Though respondents from the Faculty of Science were more positive about the use of Internet and its impact on their educational experience, all found to be

consulting Internet for seeking information for the purposes mentioned above with different percentage. This increased use of Internet may be because of unavailability and inadequacy of latest reading material from the university library.

Population and Sample

The study focused on all the 130 tutors at the Zimbabwe Open University`s 10 geographical regions. Out of this population, a convenient sample of 50 was selected based on availability.

Research Methodology

The present study was descriptive survey and as such data for this study were solicited through the use of a survey questionnaire which contained both open and closed ended questions. The descriptive survey encompassed faculty members from four faculties of the Zimbabwe Open University. Fifty faculty members who were requested to take part in the survey returned the questionnaire giving a 100% response rate. In order to ensure reliability and effectiveness of the instrument, the questionnaire was pilot tested on twenty faculty members from the same faculties.

Data presentation and Discussion

Data were grouped and presented in tables and analyzed as per themes.

Demographic data of respondents

The survey received 100% response rate faculty members, all of whom were lecturers. The data shows that all the fifty lecturers hold a Masters degree and among them, 35 have enrolled for the Doctor of Philosophy degree with the Zimbabwe Open University and other institutions. Ten of the same are actively involved in research and publication works.

Table 1: Uses to which the Internet is being put by non-fiction writers (N=50)

Purpose for accessing Internet	Responses	
	Frequency	%
Research for publication	32	64
Research for enhancing teaching/learning	35	70
Research for scholarship (PHD/Masters degrees)	45	90
Communication through e-mail and other platforms	28	56
Looking for lecture information	33	66
Recreation, eg. Playing games	11	22
Shopping	1	2

The respondents from all the faculties showed enthusiastic attitude towards use of Internet for various purposes including research and scholarship work. Internet use for research for publication purposes accounted for 32(64%) of the respondents whereas the use of the internet for research for enhancing teaching/learning accounted for 35(70%). Forty-five (90%) stated that they used the Internet for research for scholarship work as they were working towards their PHD and Masters degrees. Communication through e-mail and other platforms accounted for 28(56%) while looking for lecture information accounted for Recreation in the form of games accounted for 11(22%) and lastly, only 1(2%) used the Internet for shopping.

Though respondents showed a positive attitude towards the use of the Internet, the impact of this use should be translated into some tangible results for example an increase in the research and

publication works. Pleasing though from the findings is the fact that the majority of the respondents are using the Internet advance their studies. Also it would appear that the lecturers are not into playing games on the Internet, something that academics would not find worthy doing in light of the fact that a lot of research needs to be carried out within the limited time available.

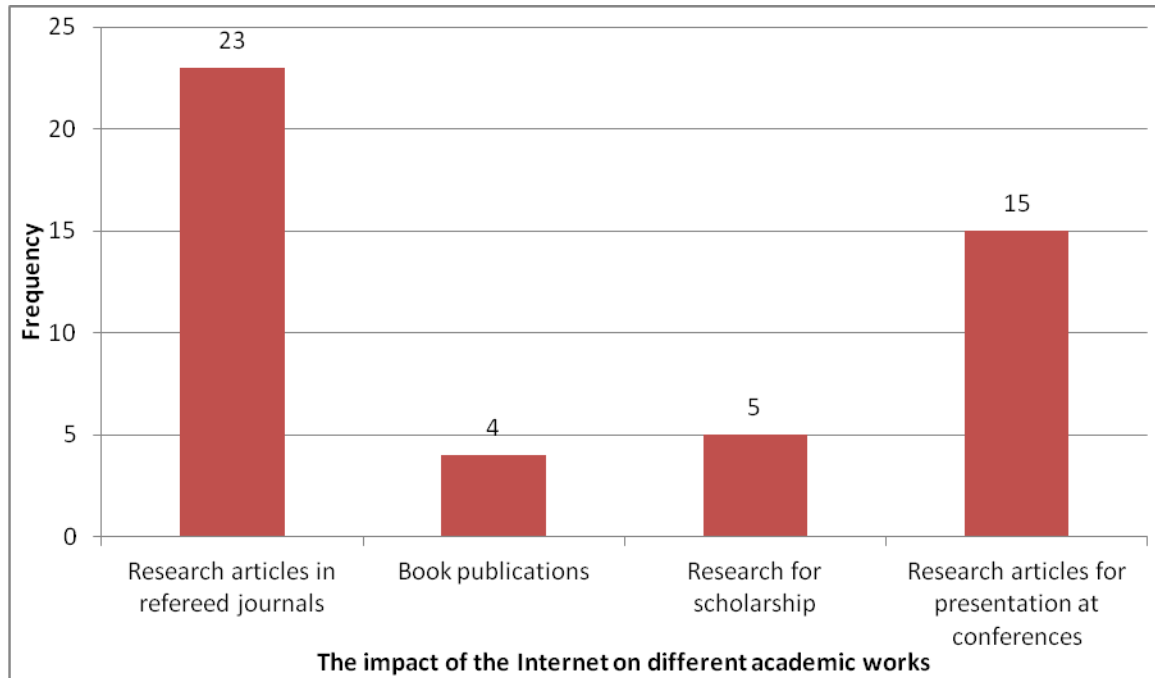


Figure 1: The extent has the Internet positively impacted on the non-fiction writing activities among lecturers

In an attempt to come up with tangible figures on the extent to which the lecturers have been using the Internet for academic and scholarly works, the study sought to find out the quantities of work produced by faculty as a result of using the Internet. Figure 1 above, shows that out of the 50(100%) lecturers, only 23 research articles and 4 books had been published among them. Fifteen papers had been produced for presentation at international conferences. Five lecturers were using the Internet for scholarship as they were studying for higher degrees. This goes to show that there is still need to consult the Internet for the production of more work. A paltry 23 researches is nothing to brag about among 50 faculty members, more so over a period of three years.

Table 2: the challenges confronting the lecturers in the use of the Internet (N=50)

Challenge	Response			
	Yes		No	
	Freq	%	Freq	%
Lack of competence in internet usage	23	44	27	56
Lack of access to blocked but vital documents	38	76	12	24
Incapacity to subscribe to vital e-libraries	45	90	5	10

Inability to subscribe even to free e-resources	46	92	4	8
Lack of knowledge on Internet data retrieving especially documents in PDF format	37	84	13	26
Inexperience in the use of the computer	11	22	39	88
Electricity blackouts	48	96	2	4
Poor connectivity	38	76	12	24

Table 2 shows that lack of competence in internet usage accounted for 23(44%) of the respondents. Thirty-eight (76%) stated that lack of access to blocked but vital documents made it difficult for them to use the internet. The majority of 45(90%) felt incapacitated to subscribe to vital e-libraries whereas on 5(10%) could subscribe. Another 46(92%) were unable to subscribe to free e-resources but 4(8%) could. This vast majority described the subscription to e-journals as expensive. Lack of knowledge on Internet data retrieving especially documents on PDF format was found to be the problem for the majority of faculty members. This accounted for 37(84%) of the lecturers while only 13(26%) had no problem. This points out to the need to provide training for faculty members for searching online information in whatever format or version. Inexperience in the use of the computer was a challenge for a minority of 11(22%) while the majority of 39(88%) had experience in the use of the computer. The challenge of electricity blackouts was prevalent accounting for 48(96%). Thirty-eight (76%) decried the poor Internet connectivity whereas this was not a challenge for a minority of 12(24%).

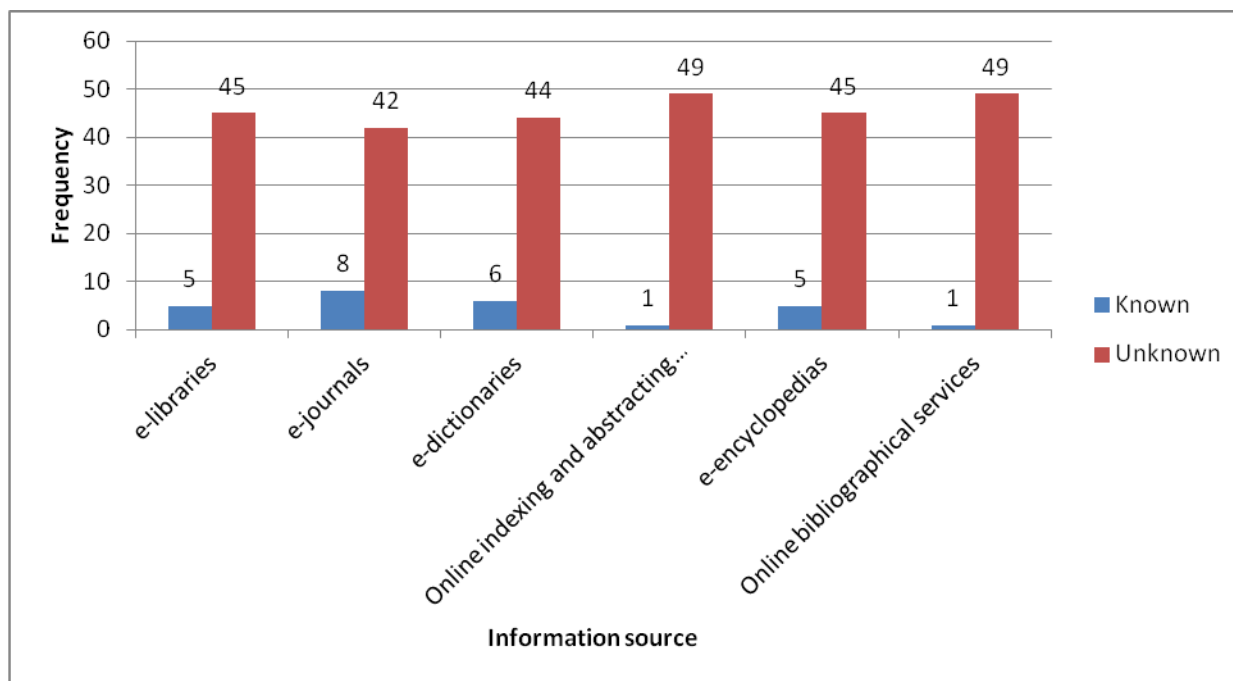


Figure 2: Sources of information that are known to the lecturers

The data in Figure 2 above shows that a very negligible percent of the faculty members have gone online to find information from the e-libraries 5(10%), e-journals 8(16%), e-dictionaries 6(12%), e-encyclopedias 5(10%), online indexing and abstracting services 1(2%) and online bibliographical services 1(2%). The use of the e-facilities was found to be low mainly due to inadequacy Internet competence among the majority of the lecturers.

The lecturers were asked to offer suggestions on how best could move towards the use of the Internet as an important facility for their day to day use. Table 3 below shows that responses obtained from the lecturers.

Table 3: The strategies meant to overcome the challenges confronting the lecturers (N=50)

Strategy	Freq	%
Intensive training in ICTs	21	
Intensive training in Internet usage	38	
Need for training in accessing documents in various versions, for example PDF documents	40	
Training in subscriptions to e-resources	45	

Table 3 shows that intensive training in ICTs was required by 21(%) whereas intensive training in Internet usage was needed by a majority of 38(%). Need for training in accessing documents in various versions, for example PDF documents Training in subscriptions to e-resources accounted for another overwhelming majority of 40(%) and 45(%) needed training on how to subscribe to e-resources on the Internet.

Major findings of the study

The following were the major findings of the study:

The respondents from all the faculties showed enthusiasm towards use of Internet for various purposes including research and scholarship work.

The Internet was used for research for publication purposes by a sizeable number of the lecturers but the majority of the lecturers used the Internet for research for scholarship work as they were working towards their PHDs and Masters degrees.

Other uses of the Internet by lecturers, though not popular, included communication through e-mail and other platforms, recreation in the form of games and shopping.

Though respondents showed a positive attitude towards the use of the Internet, the impact of this use was not being translated into tangible results as only 23 research articles and 4 books had been published among the 50 lecturers over a period of three years.

Lack of competence in internet usage and lack of access to blocked but vital documents made it difficult for the faculty members to use the internet.

The majority of faculty members felt incapacitated to subscribe to vital e-libraries while some were unable to subscribe to free e-resources

Lack of knowledge on Internet data retrieving especially documents on PDF format was found to be the problem for the majority of faculty members.

A minority was inexperienced in the use of the computer and the majority decried the poor Internet connectivity as a hindrance to the use of the internet.

A very negligible percent of the faculty members have gone online to find information from the e-libraries, e-journals, e-dictionaries, e-encyclopedias, online indexing and abstracting services and online bibliographical services.

The use of the e-facilities was found to be low mainly due to inadequacy Internet competence among the majority of the lecturers.

Recommendations

From the conclusions above, it is therefore recommended that:

There should be intensive training in ICTs particularly the use of the computer in the production of document.

There is need for intensive training in Internet usage particularly searching for information from various sources.

There is also need for training in accessing documents in various versions, for example PDF documents

Training is also required on how to subscribe to e-resources

There is need to pool resources together and subscribe as teams to these e-resources that are found to be unaffordable for individuals. The parent institution can also be asked to subscribe for the faculty.

Though expensive, lecturers are encouraged to purchase USB internet modems for connectivity where the institution is unable to provide connectivity.

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Journalism in times of change: An exploration of the professional identity of Kenyan journalists

By

Joel k. Ng'etich*

Abstract

The history of the Kenyan media is marked by an unpredictable and changing political, socio-cultural, economic and technological advances that have heavily influenced its development for the practice of journalism. This changing environment has placed a new edge of threatened professionalism. In Africa, the journalist's traditional tenets – of objectivity and neutrality – can be challenged and confronted by the journalist's patriotic sentiment and their feeling of belonging. In this mix is the seemingly declining professionalism of journalism. Given these trends mixed with the structural changes in journalism as a practice, the purpose of this study is to explore possible changes of the professional identity of Kenyan journalists. To achieve this, the study focused on the democratic assignments; the issue of professional autonomy; different aspects of audience orientation and journalists' relationships with public opinion. The study was carried out in Nairobi County and targeted practicing journalists in four leading media houses. The study is aligned to pragmatism philosophical paradigm because multiple perceptions and interpretations of professional ideals of journalism emerged. Survey technique was employed to generate both quantitative and qualitative data. The data was collected using questionnaires and interviews. Descriptive and inferential statistics was used to analyze quantitative data and thematic analysis for qualitative data. The study is important as it will provide useful guidelines that will help shape the profession of journalism in Kenya.

Keywords; journalist, professionalism, philosophical paradigm, public opinion, media houses

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Introduction

In recent years, there has been a transformation in the media industry in Kenya owing to the political, economic, social and technological developments within and outside the country. A remarkable development is the liberalization of the media market in 1998 (CCK, 2008). In the light of these changes various questions are raised in relation to the changing field of journalism. For example some people argue that what really makes a journalist is based on a social agreement. This agreement includes more than just the actual act of writing or taking a photo, since it is based on the assumption that journalists as an occupational group comply with common norms of behaviour and endorse an ethical code (Wiiki, 2010). The common norms of journalism vary between countries, but the existence of an ideological base is a general phenomenon- it is the professional identity that makes the journalist. This identity is a composition of various journalistic ideals, such as objectivity, neutrality and scrutiny. These ideals are change over time and my intention is to establish the implications of these changes in relation to social variations among journalists and to contextual changes in the occupation (Wiiki, 2010). The changing media system has affected professional working conditions in many respects and resulted in higher economic demands at all levels of the news process. In practice, these changes have meant increased time pressure and work load, with increased mental and physical strain.

Statement of the Problem

According to Hamilton (2004) Journalism as a profession faces a crisis of identity as a result of the changing nature of technology, including the access to new electronic resources, the altering scholarly publishing paradigm, and the abundance of free, and often unfiltered, information via the World Wide Web. It is against this background of threatened profession of journalism that this study was carried out to establish the factors behind transition in journalism profession in Kenya; the study seeks to determine whether journalistic ideals, occupational features and social attributes affect the identity of journalism as a profession. Previous studies have not specifically addressed the question of possible transition of professional identity of journalists in Kenya. This creates a gap in knowledge on the profession of journalism in Kenya.

Research Questions

How does the relationship between journalistic ideals and professional identity of a Kenyan journalist manifest itself?

What is the relationship between occupational features and professional identity of Kenyan journalists?

Is there a relationship between the social attributes and professional identity of Kenyan journalists?

Significance of the study

The findings will be of great importance to media companies in their efforts to improve the quality of their productions. Results will be useful to media regulatory bodies such as media council of Kenya and communication commission of Kenya.

Researchers will benefit from this study as it will provide a platform upon which they can stand to do further research on ways of improving the journalism profession in Kenya.

Data analysis and presentation

This study adopted a mixed method approach to collect both quantitative and qualitative data. This was achieved through use of questionnaire .which was semi-structured so as to collect both types of data. The sampling was probabilistic and the questionnaires were given to the respondents randomly. The data collected was checked for completeness, edited and entered into a computer for analysis. The analysis was done with an aid of computer package for data analysis SPSS version 17. The analysis was descriptive and inferential in nature. The descriptive analysis included mean and standard deviation while inferential statistics included correlation and regression.

Reliability analysis

Reliability of the questionnaire was evaluated through Cronbach's Alpha which measures the internal consistency. The Alpha measures internal consistency by establishing if certain item measures the same construct. Nunnally (1978) established the Alpha value threshold at 0.6 which the study benchmarked against. Cronbach Alpha was established for every objective in order to determine if each scale (objective) would produce consistent results should the research be done later on. Table 4.1 shows that most of the scales were significant, having an Alpha above the prescribed threshold of 0.6. Demographic information had an Alpha of 0.726, Professional ideals of journalism scale had an Alpha of 0.474, and Occupational features had an Alpha of 0.667, and Social features had an Alpha of 0.724. When all scales were combined, the Cronbach's Alpha became 0.608.

Table 4. 1 Reliability analysis

Variable	Cronbach's Alpha
Demographic information	0.726
Professional ideals of journalism	0.474
Occupational features	0.667
Social features	0.724
Overall (All scales)	0.608

From above, the reliability analysis shows that the overall of all scales is above the threshold of 0.6. Thus generally the questionnaire is reliable for the study. However, a split of the variables shows that the cronbach's Alpha is 0.474 which is below the threshold of 0.6. This indicates that the questionnaire is not internally consistent on that particular variable. The study thus recommends that the questions on the variable be reframed to make them consistent and reliable.

Demographic information

Gender

The study sought to establish the gender of the respondents. The findings are shown in figure 4.1.

Figure 4. 1 Gender

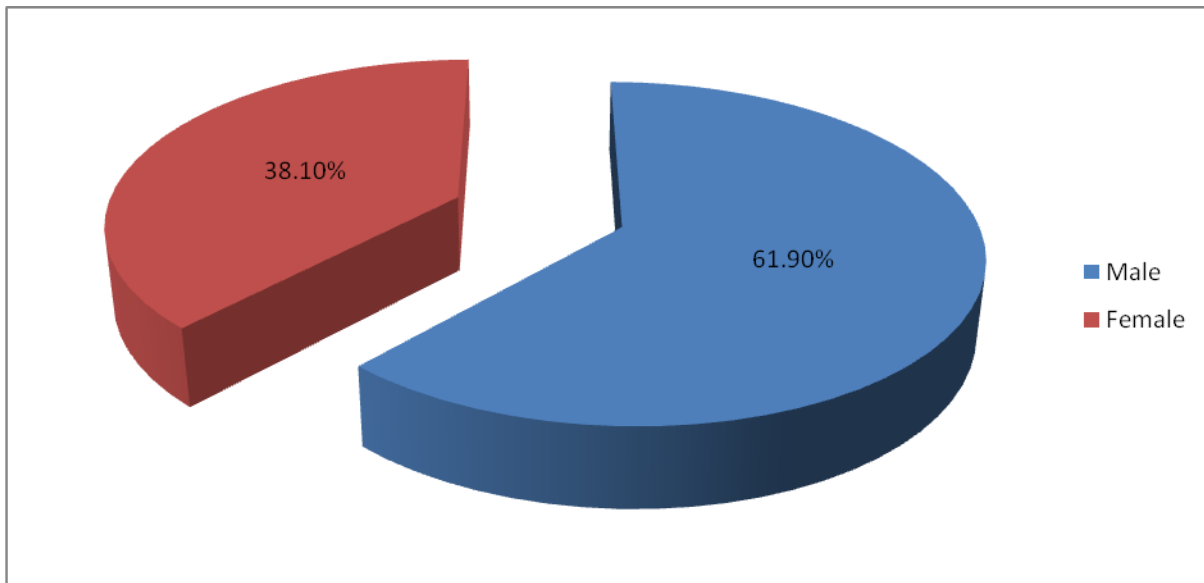


Figure 4.1 shows the findings on the gender of the respondents. From the findings, majority of the respondents were males (61.9%) while the rests were females. Also the study found that all the respondents were single. This is attributable to the fact that the respondents were all students.

Age bracket

The respondents were requested to state their ages. The findings are shown in figure 4.2.

Figure 4. 2 Age bracket

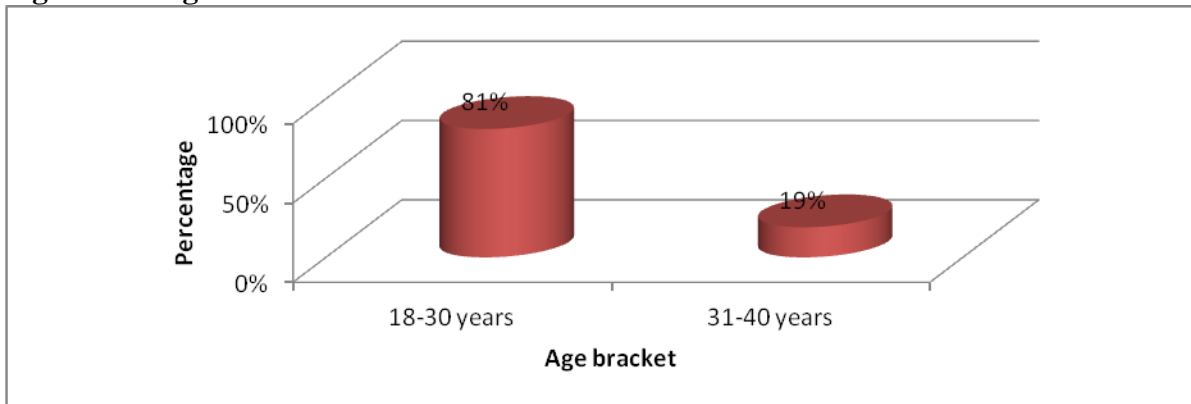


Figure 4.2 shows the findings on the ages of the respondents. According to the figure, majority of the respondents (81%) are of the age bracket 18-30 years while 19% of the respondents are of the 31-40 years. This indicates that most of the respondents were youths.

Highest level of education

The respondents were requested to state their education levels. The findings are shown in figure

Figure 4. 3 Highest level of education

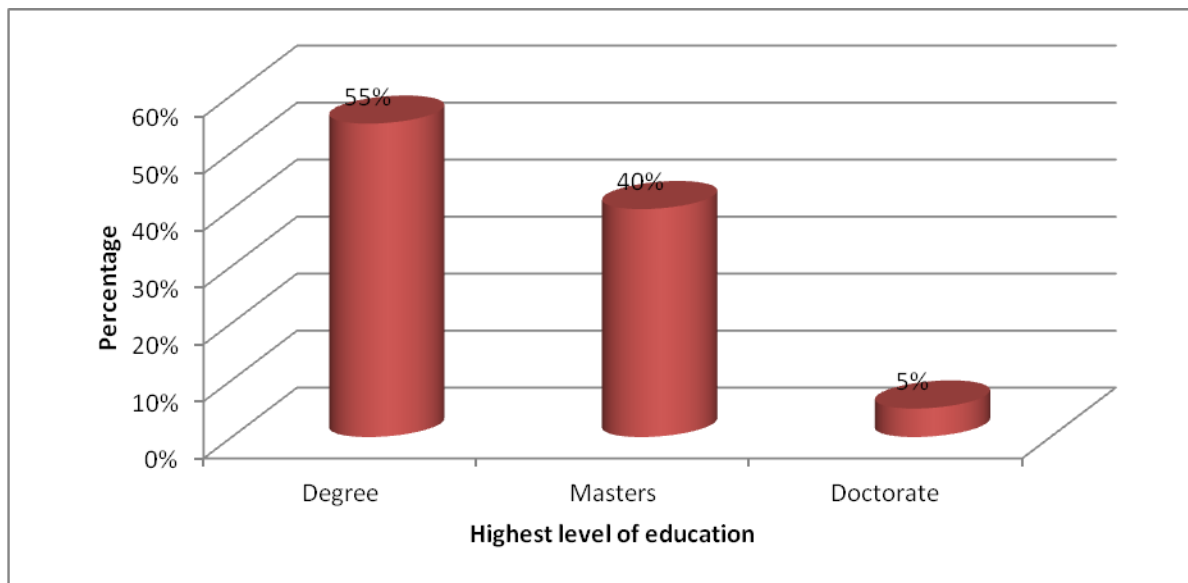
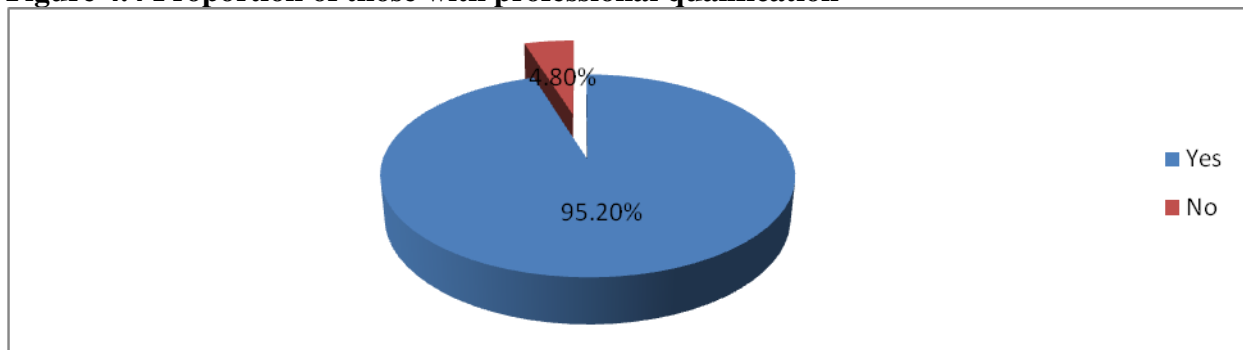


Figure 4.3 shows the highest level of education of the respondents. From the findings majority of the respondents (88%) were graduates, 40% had masters qualifications. This indicates that majority of the respondents had good qualifications.

Professional qualification

The respondents were requested to provide information on whether they had professional qualifications. The results are shown in figure 4.4.

Figure 4.4 Proportion of those with professional qualification



From the findings shown in figure 4.4, majority of the respondents indicated that they had professional qualification (95.2%). The study deduces that most of the respondents have undergone journalism professional training. The respondents had diplomas, degrees, masters and even PhD qualifications in journalism

Professional qualifications of the respondents

The respondents were requested to state their qualifications in journalism. The findings area found in figure

Figure 4. 5 Professional qualifications of the respondents

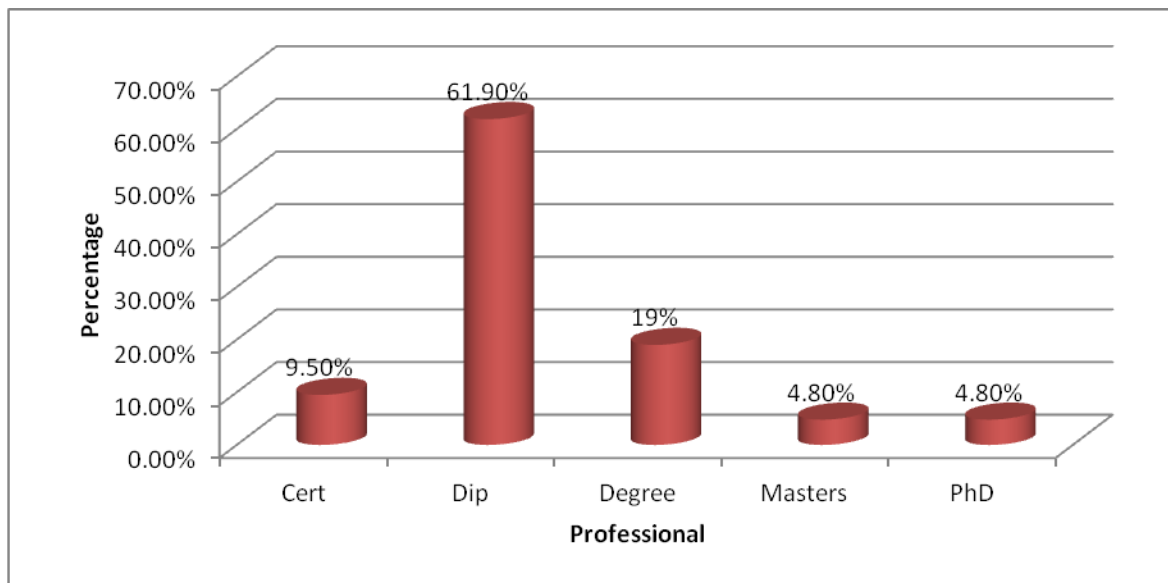


Figure 4.5 shows that majority of the respondents (61.9%) had diplomas in journalism. Others had degree (19%). Few indicated that they held masters and others had Phd.

Duration in journalism

The respondents provided information on the duration they had stayed in journalism field. The findings are shown in figure 4.6.

Figure 4. 6 Duration in journalism



From the findings shown in figure 4.6, majority of the respondents (66.7%) had been in journalism field with qualifications for less than 5 years. Majority of the respondents (62.5%) had been in journalism field without professional qualification for less than 5 years. This shows that majority of the respondents had been in journalism field for less than 5 years.

Specialization

The study sought to establish the specialization of the respondents in journalism. The findings are shown in figure

Figure 4. 7 Specializations

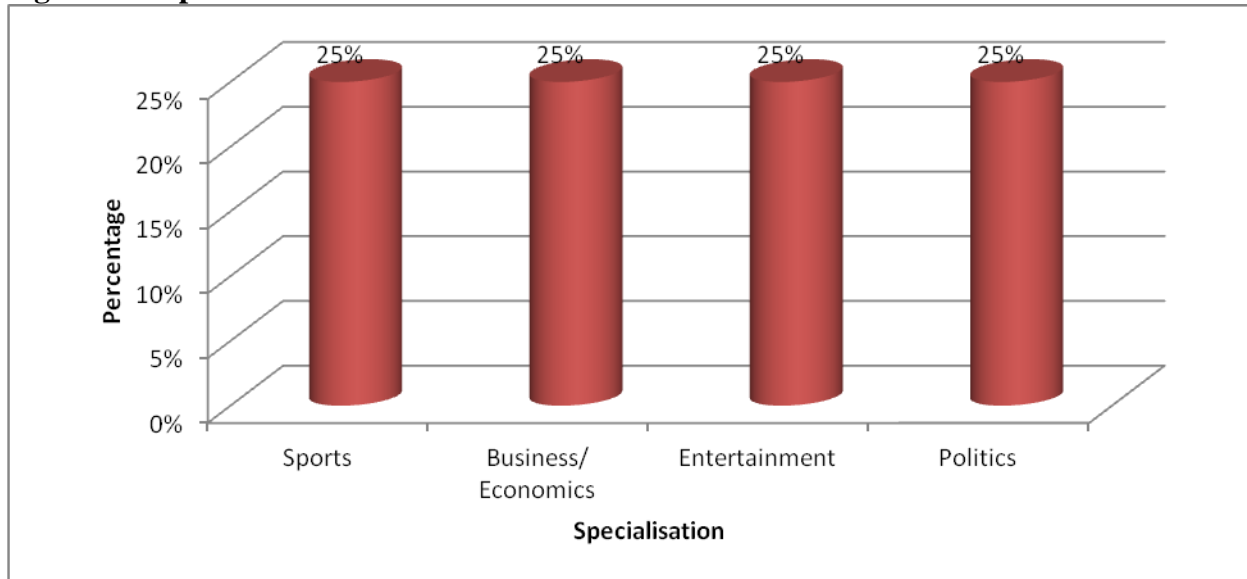
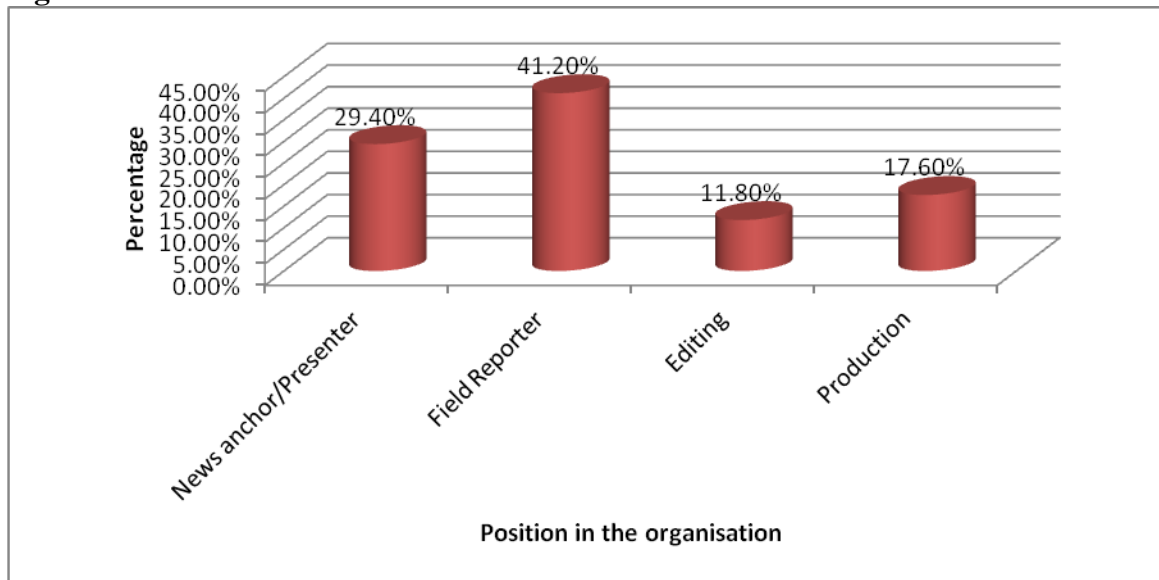


Figure 4.7 shows the findings on the specialization of the respondents in journalism field. From the findings, the respondents have specialized in journalism on the sports, business/economics, entertainments and politics on equal bases. The study deduces that students undertaking studies have highly specialized.

Position

The study collected data from the respondents on the positions they held in their organization. The findings are shown in figure

Figure 4. 8 Positions



There are different positions which journalists take in their work. From this study most of the respondents (41.2%) were field reporters, 29.4% were news anchor/presenters and 17.6% held production roles. This study deduces that most of the respondents held different positions in journalism field.

Media houses of the respondents

The respondents who took part in this study were from different media houses. The findings are shown in figure 4.9.

Figure 4. 9 Media houses of the respondents

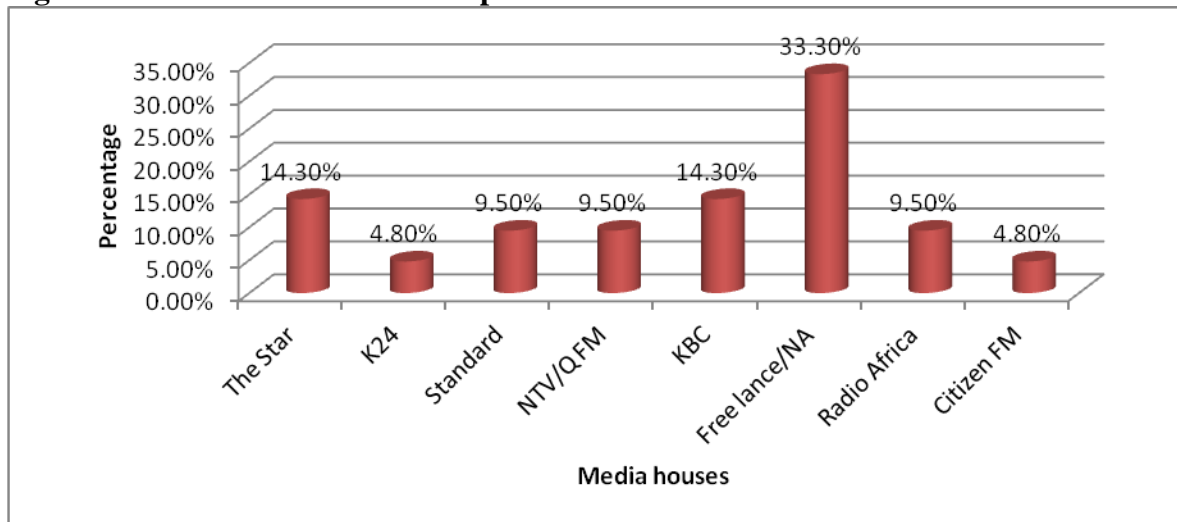


Figure 4.9 shows that most of the respondents (33.3%) were freelancers, 14.30% worked with KBC, 14.3% worked with the star, 9.5% with Nation, standard and Radio Africa. This shows that the responses were from different and diverse media houses.

Profession of journalism

Journalism ideals

The study established the perception of the respondents on the journalistic ideals. The findings are shown in figure 4.10.

Figure 4. 10 Journalism ideals

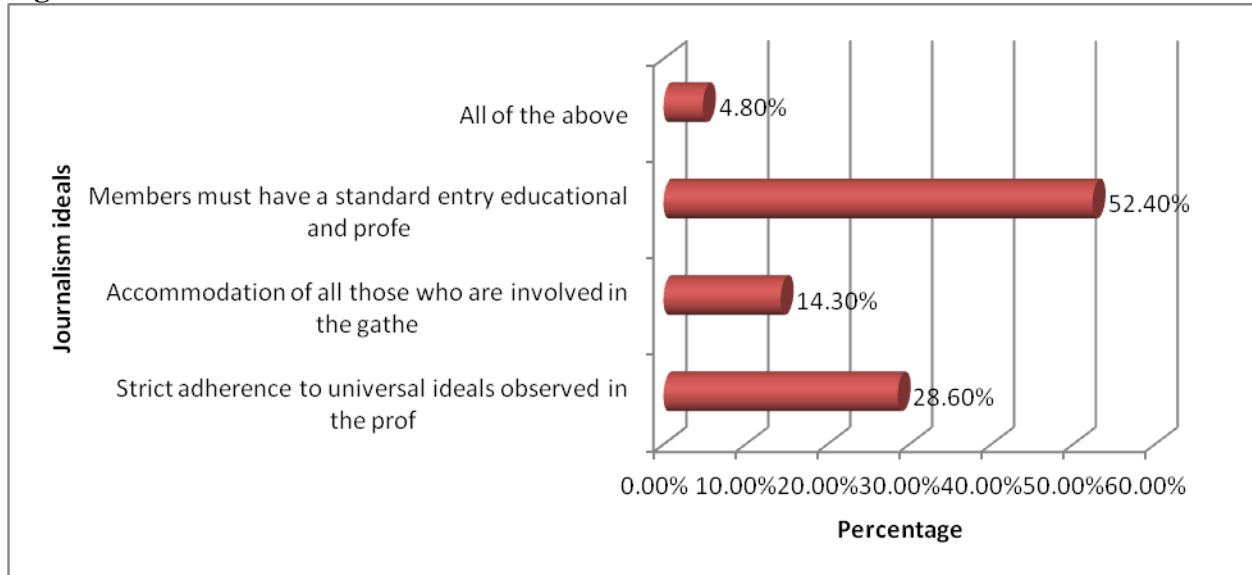


Figure 4.10 shows that majority of the respondents (52.4%) viewed that journalism ideals has to do with members must have a standard entry educational and professional qualifications. 28.6% understand journalistic ideals as strict adherence to universal ideals as observed in professional training. The study deduces that majority of the respondents understand journalism ideals in terms of adherence to universal ideals and for those with educational and profession.

Changes in journalism

The study established that all people believe that journalism has changed from what it used to be some years ago.

Figure 4.11
journalism

4.

11

Changes

in

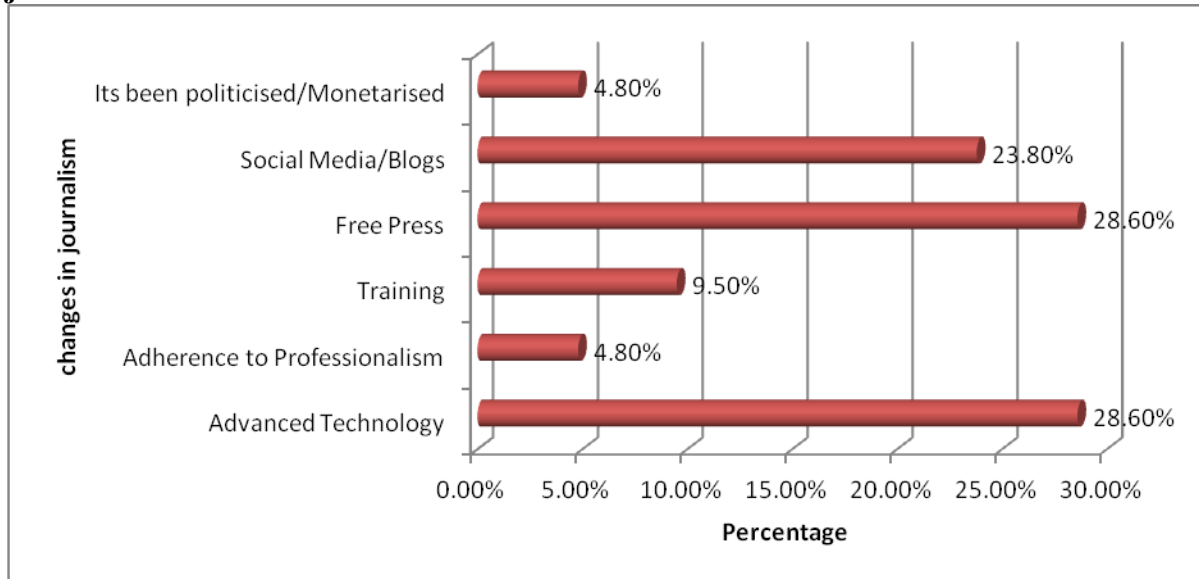
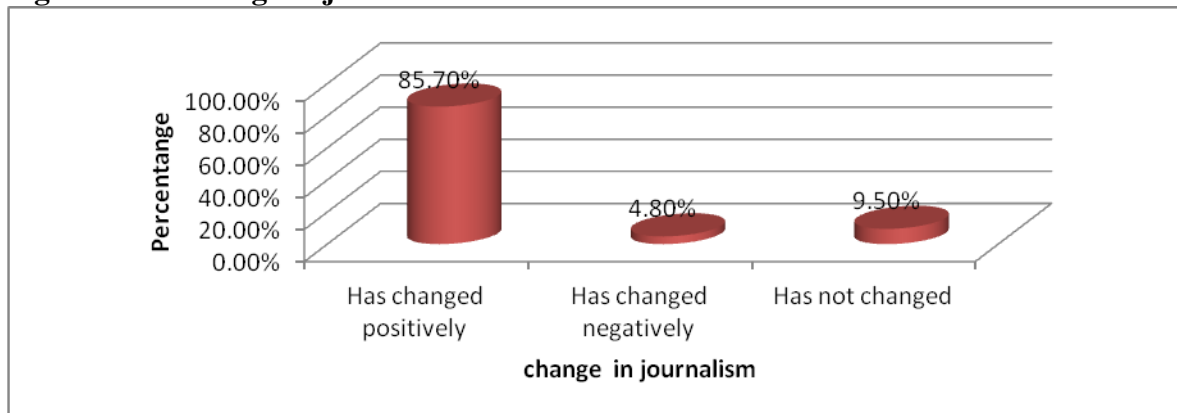


Figure 4.11 shows that most of the respondents (28.6%) believe that journalism has changed from what it used to be some 5 years ago due to advanced technology and free press. The journalism has also changed because of blogs and social. Training has also changed in journalism.

Change in journalism

The study collected information from the respondents on how the field of journalism has changed. The results are shown in figure 4.12.

Figure 4. 12 Change in journalism



From the findings shown in figure 4.12, majority of the respondents believe that journalism has changed positively (85.7%). 9.5% believe that the field of journalism has not changed at all. The study deduces that journalists believe that journalism has changed in a good way from what it used to be ago.

Ideals of journalists

The respondents provided data on the ideals of journalism as a profession. The findings are shown in table 4.2.

Table 4. 2 Ideals of journalists

	Frequency	Mean	Std. Dev
scrutinizing those in power	316	4.0952	.70034
letting different opinions be heard	316	4.8095	.67964
objectively mediating news	316	4.3000	.65695
Reporting events naturally	316	4.2857	.71714
Providing diversion to the audience	316	3.7619	1.13599
Explaining complicated events to the audience	316	4.8095	.40237
Stimulating new thoughts and ideas	316	4.1667	1.04319
Influencing public opinion	316	2.9500	.82558
Acting as a mirror of the public opinion	316	3.8500	1.08942
Acting as a mouthpiece for local opinion	316	3.8947	.93659
Entertaining the public	316	3.6500	.67082
Giving people experience	316	3.7368	.73349

Table 4.2 shows the findings on the ideals of journalism. The responses were recorded using a likert scale of 5 units where 1 represents ‘strongly disagree’, 2 –disagree, 3-neutral, 4-agree and 5 –strongly agree. The responses were analysed using descriptive statics such as mean and standard deviation.

According to the scale those variables with a mean close to 4.0 were rated by the respondents as agreed, those with a close to 3.0 represents neutral while those with a mean close to 2 represents disagreed variables. At the same time standard deviation was used to indicate the extent of dispersion of the responses of from the respondents.

From the findings of this study, some of the ideals of journalists include scrutinizing those in power (M=4.0), allowing different opinions be heard (M=4.8) and explaining complicated events to the audience (M=4.8). Others perceive journalistic ideals as being objectively able to mediate news (M=4.3) and report events naturally (M=4.2). Journalistic ideals of journalist are also seen in their ability to stimulate new thoughts and ideas (M=4.1), being as a mirror of the public (M=3.8), acting as a mouthpiece for local opinion (M=3.8), entertaining the public and giving people experience (M=3.7).

Nature of journalism profession

The respondents provided information on the nature of journalism field. The results are shown in table 4.3.

Table 4. 3 Nature of journalism profession

	Frequency	Mean	Std. Dev
The advent of liberalization policy has influenced the autonomy of Kenyan journalists.	21	4.4762	.67964
Journalism is a professional occupation	18	4.0556	.93760
Kenyan Journalist adhere to the principle of serving the interests of the public rather than their own interest or organizational interests.	21	3.0000	.94868
Formal education in journalism is critical in shaping journalism as a profession.	21	4.7619	.43644
Experience in the field of journalism has an influence in the performance of Kenyan Journalist	21	4.0952	.76842
Journalists are expected to adhere strictly to the code of conduct and ethics in the performance of their duties.	21	4.3333	.79582

Table 4.3 shows the findings on the nature of journalism. The responses were recorded using a likert scale of 5 units where 1 represents ‘no extent at all’, 2 –low extent, 3-moderate extent, 4-great extent and 5 –very great extent. The responses were analysed using descriptive statics such as mean and standard deviation.

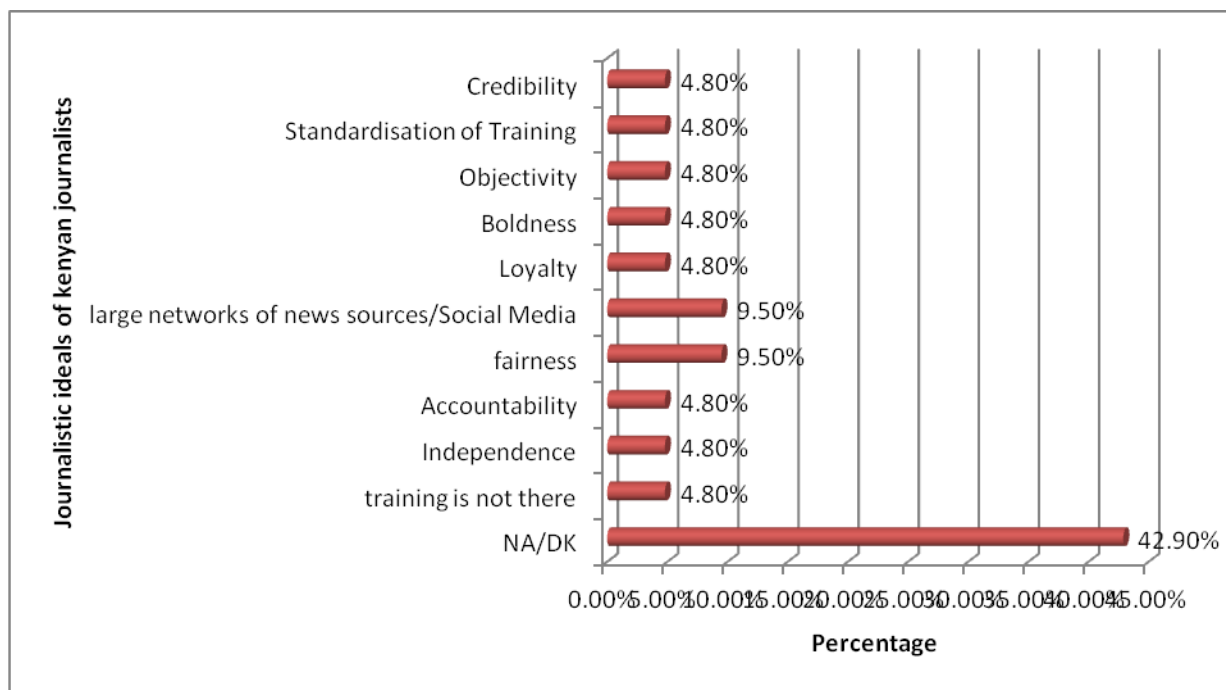
According to the scale those variables with a mean close to 4.0 were rated by the respondents as agreed, those with a close to 3.0 represents neutral while those with a mean close to 2 represents disagreed variables. At the same time standard deviation was used to indicate the extent of dispersion of the responses of from the respondents.

The field of journalism is complicated and has many influences. From the findings, the autonomy of journalism has been influenced by the advent of liberalization policy (M=4.4). It is a professional occupation (M=4.0) which desires formal education as a profession (4.7). The profession of journalism is affected by the experience of the journalists (M=4.0) and the profession requires that journalists adhere to the code of conduct and ethics in the performance of their duties (M=4.3).

Other journalistic ideals associated with journalism profession

The respondents were requested to state other journalistic ideals associated with journalism. The findings are shown in figure 4.13

Figure 4. 13 Other journalistic ideals associated with journalism profession



Other journalistic ideals associated with journalism profession according to the respondents are that journalism field is a field of independence, accountability, fairness, large network of news sources, loyalty, boldness, objectivity, standardization of training and credibility. Notably, the profession lacks adequate training to the practicing journalists.

External influence on profession of journalism

The study collected data on the external influences on the profession of journalism. The findings are shown in table 4.4.

Table 4. 4 External influences on profession of journalism

	Frequency	Mean	Std. Dev
Technology	21	4.8571	.35857
Politics	21	4.8095	.51177
Globalization	21	4.5714	.92582
Commercialization	21	4.8571	.35857
Culture	21	2.5238	1.60060
Regulations (From both the Gov't and Industry regulators)	21	3.0000	1.18322

Table 4.4 shows the findings on the external influences on journalism. The responses were recorded using a likert scale of 5 units where 1 represents 'no extent at all', 2 –low extent, 3-moderate extent, 4-great extent and 5 –very great extent. The responses were analysed using descriptive statistics such as mean and standard deviation.

According to the scale those variables with a mean close to 4.0 were rated by the respondents as agreed, those with a close to 3.0 represents neutral while those with a mean close to 2 represents disagreed variables. At the same time standard deviation was used to indicate the extent of dispersion of the responses of from the respondents

From the findings, the field of journalism is highly influenced by technological advancements (M=4.8), politics (M=4.8) and globalization (M=4.5). The aspect of commercialization has also influenced journalism greatly (M=4.8).

Factors influencing publications of events

The study collected data on the factors influencing publications of events. The findings are shown in table 4.5.

Table 4. 5 Factors influencing publications of events

	Frequency	Mean	Std. Dev
It is sensational and unexpected	21	4.8095	.40237
There is a good image material	21	3.4286	1.36277
It has consequences for peoples everyday life	21	4.2857	1.00712
There is a good press release	21	3.0476	.97346
It is dramatic and exciting	21	3.9048	.70034

Table 4.5 shows the findings on the factors which influence publication of events and materials.. The responses were recorded using a likert scale of 5 units where 1 represents ‘no extent at all’, 2 –low extent, 3-moderate extent, 4-great extent and 5 –very great extent. The responses were analysed using descriptive statics such as mean and standard deviation.

According to the scale those variables with a mean close to 4.0 were rated by the respondents as agreed, those with a close to 3.0 represents neutral while those with a mean close to 2 represents disagreed variables. At the same time standard deviation was used to indicate the extent of dispersion of the responses of from the respondents.

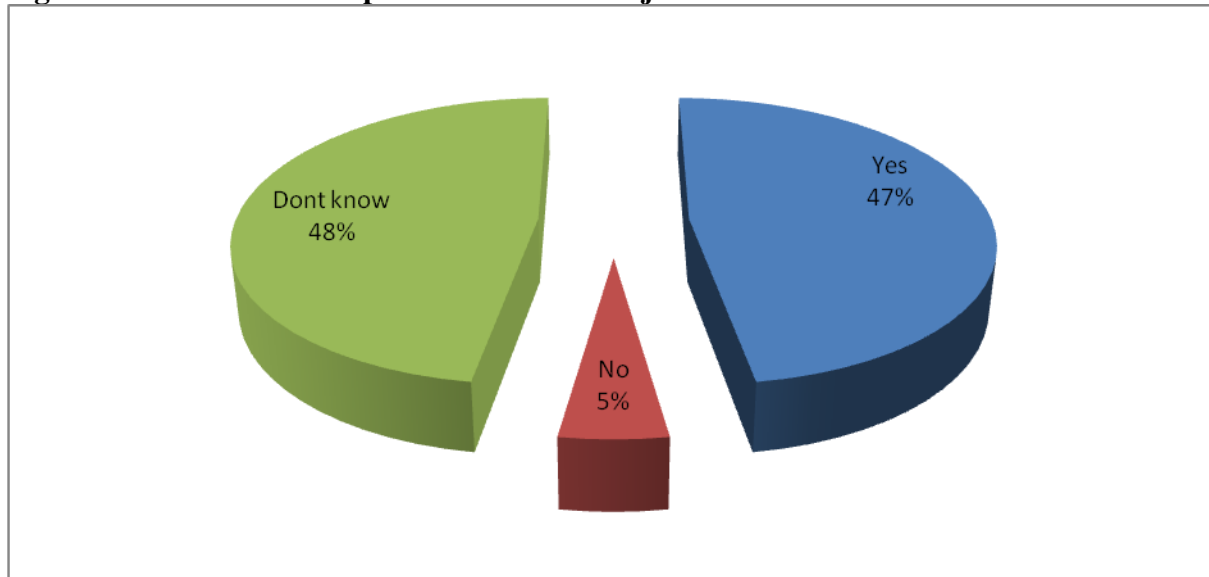
From the findings, publications of events is influenced by the nature of the event on whether it is sensational and unexpected (M=4.8) and whether the events has consequences on people’s lives (M=4.2). The study has established that it depends whether the event is dramatic and exiting (M=3.9).

Occupational influence

Effect of occupational features on journalism

The respondents were requested d to state whether the occupation of journalism had influence of the professional ideals of journalism field. The results are shown in figure 4.14.

Figure 4. 14 Effect of occupational features on journalism



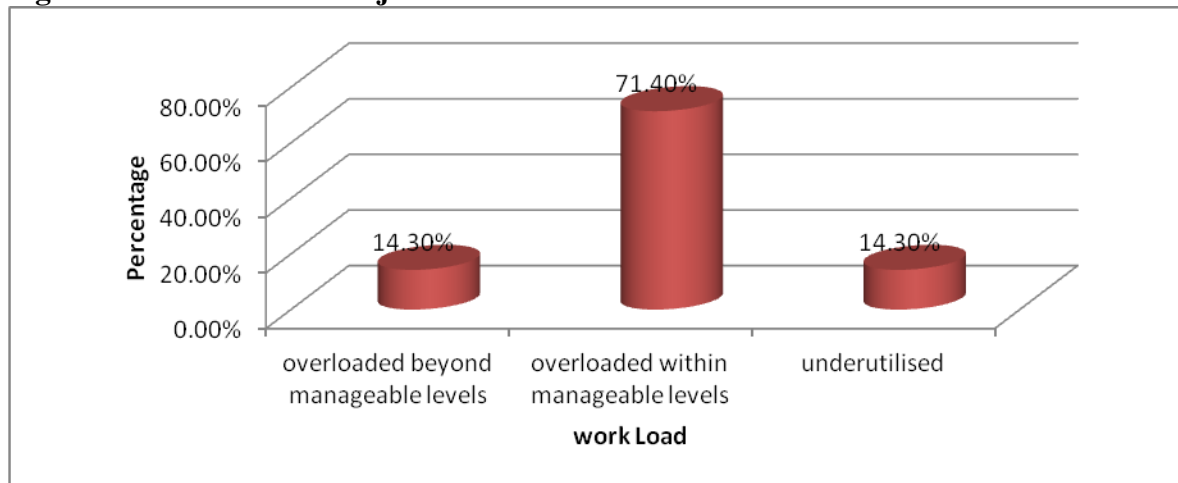
From the findings shown in figure 4.14, most of the respondents (48%) do not know whether the occupational aspects of journalism affect the profession of journalism. However, a sizeable

number (47%) agreed that the occupational aspects of journalism affected the profession of journalism. This study deduces that the occupational aspects of journalism affect its profession.

Work load of journalists

The study requested the respondents to provide information the workload of the journalists. The findings are shown in figure 4.15.

Figure 4. 15 Work loads of journalists

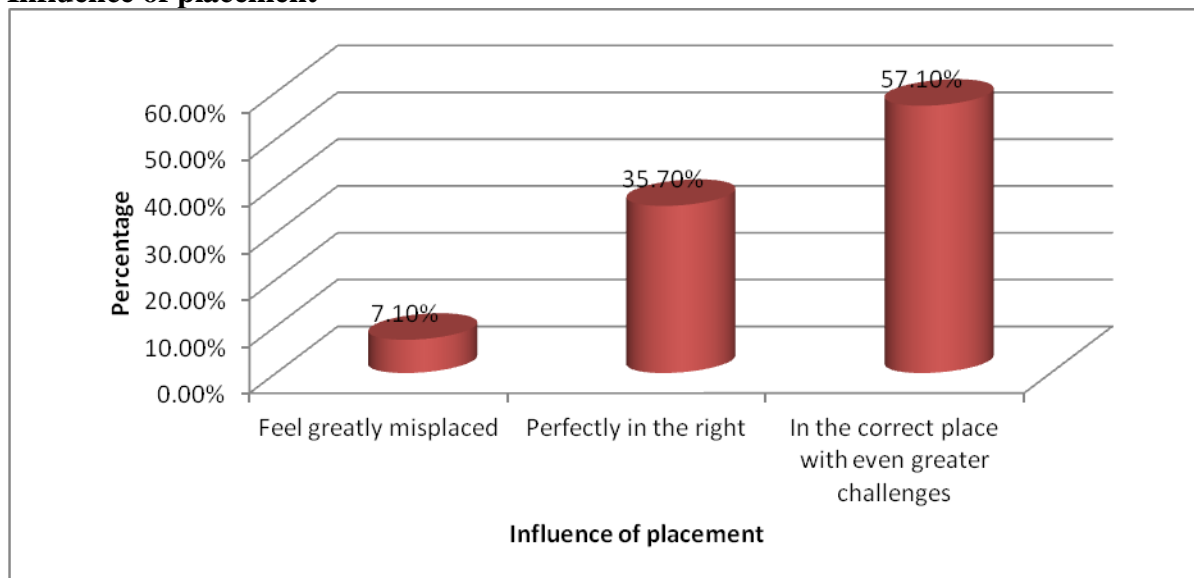


From the findings shown in figure 4.15, the journalists seem to be overloaded by their work although they are overloaded within manageable levels (71.4%). Others cited that journalists overloaded beyond manageable levels while others cited that they were underutilized.

Influence of placement

The study sought to establish whether placement of the journalist influenced their profession. The findings are shown in figure 4.16.

Influence of placement



From the findings shown in figure 4.16, majority of the respondents (57.1%) cited that they were in the correct place though there were challenges. Others (35.7%) cited that they were in a perfectly right place. This implies that placement of journalists does not influence they profession.

Influence of alternative media

The researcher requested the respondents provide information on how the alternative media had influenced the reporting by the journalists. The findings are shown in figure 4.17.

Figure 4. 17 Influence of alternative media

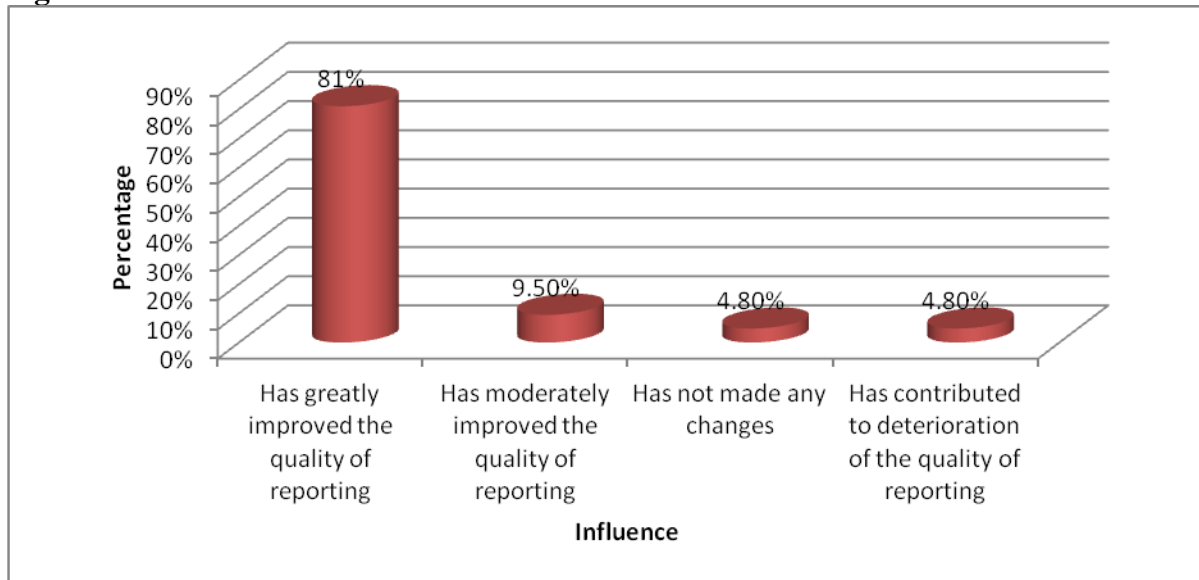
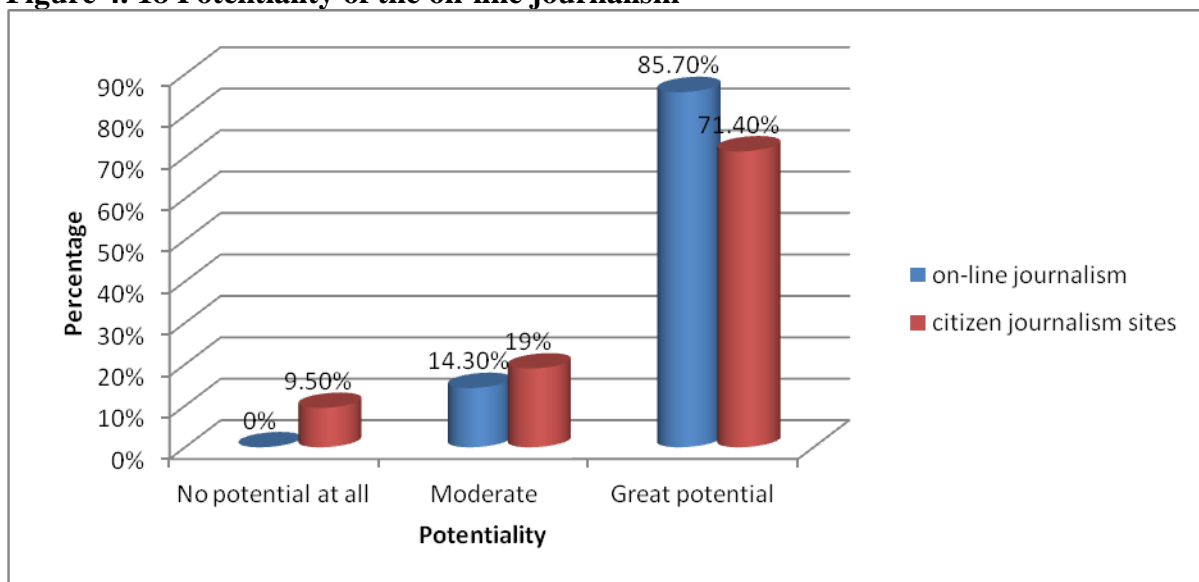


Figure 4.17 shows the findings on the influences of the alternative media on reporting. From the findings, majority of the respondents (81%) contented that the alternative media has greatly improved the quality of reporting. However, 4.8% opined that alternative media had lead to deterioration of the quality of reporting.

Potentiality of the on-line journalism

The respondents commended on the potentiality of the on-line journalism and citizen reporting. The findings are shown in figure 4.18.

Figure 4. 18 Potentiality of the on-line journalism



The findings on the potentiality of on-line and citizen reporting are shown in figure 4.18. According to the figure, the use and potential of on-line journalism is increasing and has got great potential for growth and delivery of information (85.7%). Also the citizen reporting has grown and has a great potential for growth (71.4%). This implies that traditional journalism has enormously grown.

Intermix of occupation and profession of journalism

The respondents provided information on the influence of occupational aspects on journalism. The findings are tabulated in the table 4.6.

Table 4. 6 Occupational influences on journalism

	Frequency	Mean	Std. Dev
Position of the journalist	21	4.2	0.8
Area of coverage of the journalists	21	4.0	0.8
Risk of investigative journalists	18	3.2	1.6
The competition of media houses	19	4.4	0.7
Speed of information	19	3.9	1.0
Exposing confidential information to the public	21	4.0	0.7
The timing of their work e.g working at night	21	3.8	0.7
Sourcing of information (unavailability of the needed information)	21	3.9	0.8

Table 4.6 shows the findings on the factors which influence publication of events and materials.. The responses were recorded using a likert scale of 5 units where 1 represents ‘no extent at all’, 2 –low extent, 3-moderate extent, 4-great extent and 5 –very great extent. The responses were analysed using descriptive statics such as mean and standard deviation.

According to the scale those variables with a mean close to 4.0 were rated by the respondents as agreed, those with a close to 3.0 represents neutral while those with a mean close to 2 represents disagreed variables. At the same time standard deviation was used to indicate the extent of dispersion of the responses of from the respondents.

From the results, the position of journalists affects their output as journalists to a great extent (M=4.2). The area of coverage also influences their output to a great extent (M=4.0). The respondents cited that competition among the media houses had also affected the productivity of the journalists to a great extent (M=4.4). The risk and sensitivity of exposing confidential information to the public (M=4.0), speed of information transfer (M=3.9) and the timing of their work (M=3.8) greatly influenced the output of journalists. The findings also show that the sourcing of the information also greatly influenced the output of journalism to a great extent (3.9).

Foreseen changes in journalism

The respondents stated what they perceived to be the future of journalism. The findings are shown in figure 4.19

Figure 4. 19 Foreseen changes In journalism

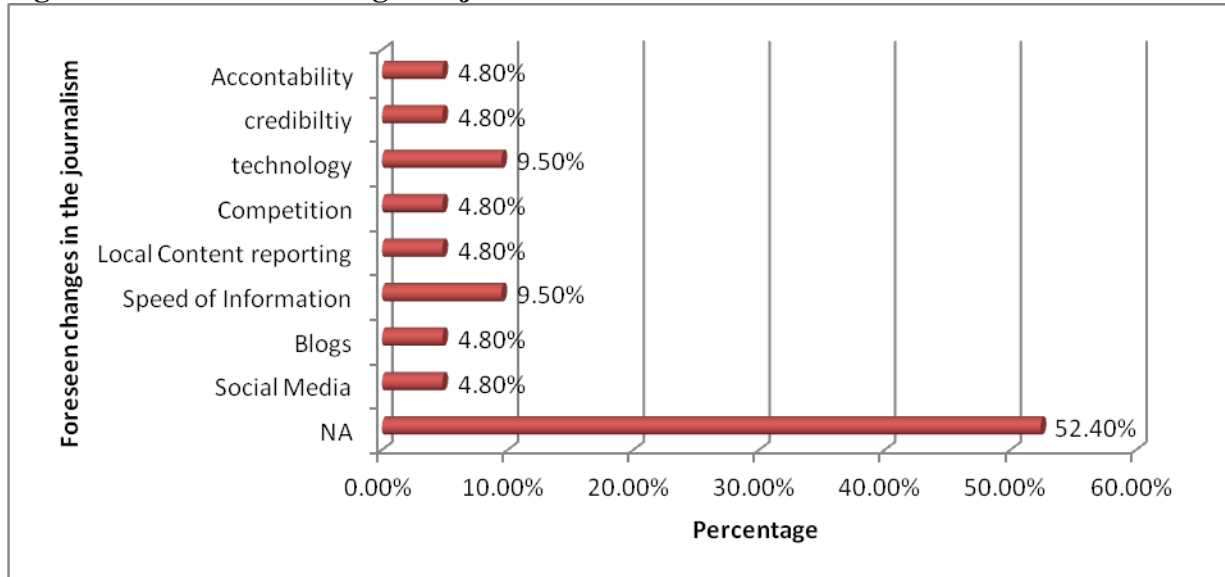


Figure 4.19 shows the findings on the foreseen changes in journalism from the findings, majority of the respondents did not have any foreseen changes. (52.4%). Other perceived changes include technology (9.5%), speed in information (9.5%). Other foreseen changes in journalism include dilution in accountability and credibility, increased competition, use of blogs and social media.

Social influence

The respondents provided information on the influence of the society on the output of the journalists. The findings are shown in table 4.7.

Table 4. 7 Influence of social attributes

	Frequency	Mean	Std. Dev
Age of the journalist	316	3.05	1.40
Education level of the journalist	316	4.25	1.02
Professional qualification	316	4.19	0.98
Gender of the journalist	316	2.48	1.21
Marital status	316	2.95	0.92
Income level	316	3.90	0.89

Table 4.7 shows the findings on the factors which influence publication of events and materials.. The responses were recorded using a likert scale of 5 units where 1 represents ‘no extent at all’, 2 –low extent, 3-moderate extent, 4-great extent and 5 –very great extent. The responses were analysed using descriptive statics such as mean and standard deviation. According to the scale those variables with a mean close to 4.0 were rated by the respondents as agreed, those with a close to 3.0 represents neutral while those with a mean close to 2 represents disagreed variables. At the same time standard deviation was used to indicate the extent of dispersion of the responses of from the respondents. From table 4.6, the education level of the journalists affects their output to a great extent (M=4.2). The professional qualifications of the journalists also affected their output to a great extent (M=4.1). Lastly the study established that the income level of the journalists influenced their output greatly (M=3.9).

Influence of liberation in media industry

The respondents provided information on the influence of liberation of media industry. The findings are shown in figure 4.20.

Figure 4. 20 Influence of liberation in media industry

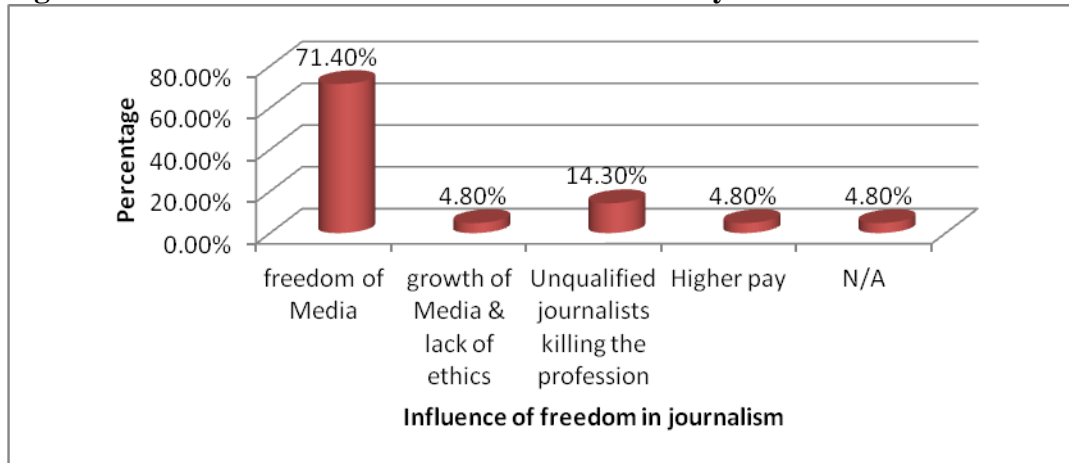


Figure 4.20 show that liberation of the media has had the following influences. Majority of the respondents (71.4%) indicated freedom of media. 14.3% indicated the upsurge of unqualified journalists in journalism work, lack of ethics and increase in pays.

Suggestions on the way forward on journalism

The respondents suggested the measures which they thought could improve the professional identity of journalism in Kenya. The findings are shown in figure 4.21.

Figure 4. 21 Suggestions on the way forward on journalism

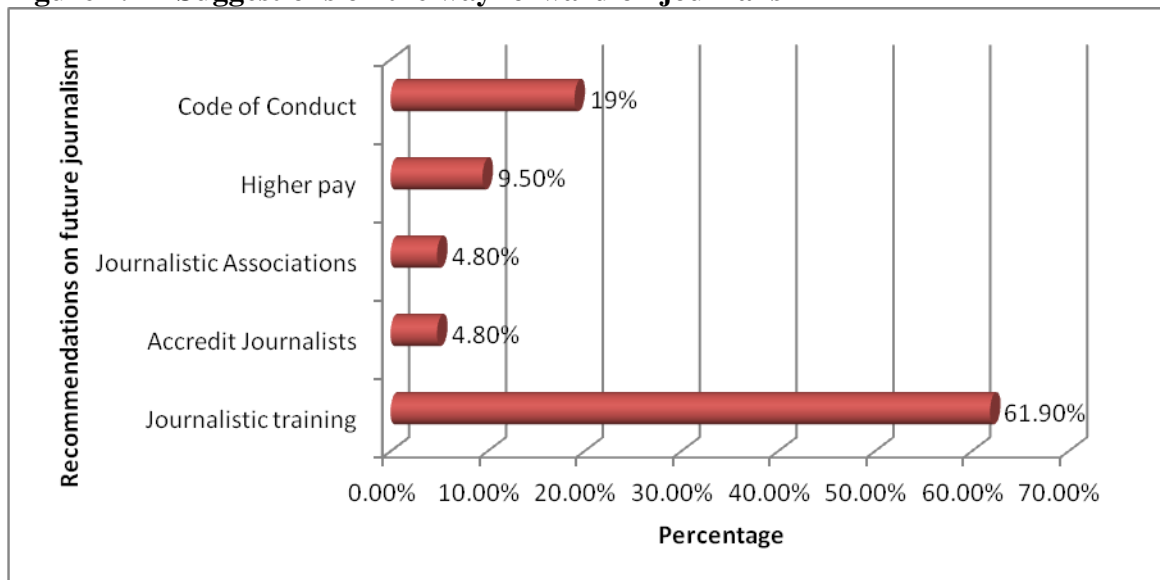


Figure 4.21 shows that majority of the respondents recommended that journalism identity could be maintained by journalistic training (61.9%). Others indicated strict adherence to the code of ethics (19%), 9,5% suggested that journalists be paid highly while the rest suggested that journalists be accredited.

Inferential analysis

The stud undertook the following inferential analysis to achieve the objectives.

Correlation analysis

Correlation analysis to establish the relationship between the professions of journalism with the variables of the study

Table 4. 8 Correlation analyses

Variable	Correlation value with profession of journalism
Occupation	-.153
Professional qualification	.154
Alternative media	-.234
Politics	-.345
Globalisation	.012
Commercialisation	-.0435
Culture	0.132
Competition	-.185

The correlation analysis was done by Pearson. A value close to 1 indicates that the variables are strongly correlated, a value close to -1 indicates the variables are strongly inversely related and 0 shows that the variables have no relations at all. From the findings, the professional identity of journalism seems to be inversely related with some variables. The occupation feature of the field is negatively related to the identity. Qualifications in journalism and professional identity are directly related. The emergence of the alternative media is negatively related to the profession ethics. Politics, commercialization and competition are all related negatively with profession of journalism.

Regression analysis

They did a regression analysis to establish how the variables affected the profession of journalism.

Table 4. 9 Model Summaries

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.756 ^a	.571	.250	1.22474

The study established a R square of 0.571. Thus the variables explained 57.1% of the variation in the dependent variable. This means that profession qualification, technology, globalization, alternative media, culture and politics explain the changes in profession of journalism by 57.1%. the rest 42.9% is explained by other factors.

Table 4. 10 Regression analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.151	3.013		-.382	.709
	Technology	.123	.641	.070	.191	.852
	Politics	-.20	.363	.016	.054	.957
	Globalisation	.115	.252	.170	.456	.657
	Commercialisation	-.003	.561	-.002	-.005	.996
	Culture	-.064	.136	-.161	-.471	.646
	Alternative Media	-.172	.243	.218	.707	.493

Professional qualification	.325	.329	.309	.989	.342
a. Dependent Variable: Journalism professional identity in Kenya					

From the regression above the professional identity of journalism is affected by the mentioned factors. The professional identity is affected negatively by politics (-0.200), commercialization (0.003), culture (0.064) and alternative media (-0.172). The profession is improved by technology (0.123), globalization (0.115) and the professional qualifications of the journalists (0.325)

Discussion, conclusion and recommendations of the study

Introduction

This study sought to establish the professional identity of the journalism as a profession. The study too was motivated by the need to establish the influences on journalism especially the occupational and social influences. This chapter presents the discussions of the findings, conclusions and recommendations.

Demographic information

Majority of the respondents who took part in this study were males (61.9%) and generally all the respondents were single and unmarried. This could have due to the fact that most of the respondents were students taking journalism classes. The respondents were young with majority of them (81%) of the age bracket 18-30 years while 19% were of the age bracket 31-40 years. The respondents had good academic qualifications with majority of them (88%) having degrees while 40% had post graduate qualifications.

The professional qualification of the respondents was good. Majority of them had undergone journalism professional training (95.2%) ranging from diplomas, degrees, masters and even PhD. Also the study found that most of the respondents (66.7%) had no much experience in journalism with less than 5 years experience in journalism field with the relevant journalism skills. The respondents had highly specialized in journalism in various fields such as sports, business/economics, entertainment and politics. The respondents had different positions in their places of work. From the study (41.2%) were field reporters, 29.4% were news anchor/presenters and 17.6% held production roles in different media houses in Kenya.

Discussion of the findings

The profession of journalism is a profession of its own features. The journalistic ideals start from the standard entry of educational and professional background (52.4%). It is a profession where the members must observe strict adherence to universal ideals as observed in professional training. The study findings outline that journalism has changed from what it used to be some years ago this is attributable to factors such as the advanced technology, training, free press, alternative media such as blogs and social media and influence from politics. Notably, the field of journalism has changed positively (85.7%) although some of the journalists believe that is has not changed at all (9.5%).

The field of journalism not only lays the codes of ethics to be followed by the journalists but also bestows a sense of responsibility to the journalist. According to the study the journalists should

scrutinize those in power (M=4.0) and allow different opinions to be heard (M=4.8). They should explain to the audience the complicated events (M=4.8). the profession of journalism trains journalists to objectively mediate news and report events naturally (M=4.2). They should be able to stimulate new thoughts and ideas (M=4.1) and act as mirror of the public good for emulation (M=3.8). Journalists are dutifully act as a mouthpiece for local opinion (M=3.8) and have a role to entertain the public (M=3.7).

The profession of journalism is complicated and prone to many influences. The study noted that autonomy of journalism has been influenced by the advent of liberalization policies (M=4.4). It is a profession and at the same time an occupation (M=4.0) which needs formal education as a profession (M=4.7). The profession of journalism is adversely affected by the experience of the journalists (M=4.0). The profession strictly requires the journalists to strictly adhere to the code of conduct and ethics while executing their duties (M=4.3). Other journalistic ideals associated with journalism profession according to the study findings portray journalism field as a field of independence, accountability, fairness, large network of news sources, loyalty, boldness, objectivity, standardization of training and credibility.

The field of journalism has been greatly influenced by external influences such as the technical advancements to a great extent (M=4.8). The politics have also greatly affected the professionalism of journalism to a very great extent (M=4.8). The advent of new and quick means of transport and globalization has also affected the field of journalism to a very great extent (M=4.5). Since the field was commercialized, the aspect of making profits has changed the focus to profit making interests which has made the journalist to publish and report content which can get market while ignoring the professional conduct of the field.

The study findings established the factors which influence the publications of events. The noted that the publications depends on whether the event is sensational and unexpected (M=4.8) and whether the event has consequences on people's lives (M=4.2) and whether it is dramatic and exiting (M=3.9). The occupation of journalists affects the profession of journalism (47%). The work load is overloading though it is within manageable levels (71.4%). The placement of the journalists seems to have no serious consequences on the journalism profession since most of the journalists believe they are in the right place amidst challenges. The alternative media has greatly improved the quality of reporting (81%). The use and potential of on-line journalism is increasing and has got great potential for growth and delivery of information (85.7%). Also the citizen reporting has grown and has a great potential for growth (71.4%).

The occupation of journalists affects the field of journalism in different ways. The position of the journalists affects their output to a great extent (4.2). The area of coverage also influences the output of the journalists to a great extent (M=4.0). The competition among the media houses has also affected the productivity of the journalists to a great extent (M=4.4). Other factors such as the risk and sensitivity of exposing confidential information to the public (M=4.0), speed of information transfer (M=3.9) and the timing of their work (M=3.8) greatly influences the output of journalists. Social media, blogs, speed of information transfer, local content reporting, technology, credibility and accountability are among other factors which affect the quality of journalists. On the social influences, education level of the journalists affects the output to a great extent (M=4.2). The output of the journalists is also affected by professional qualifications of the journalists (M=4.1) and the income level of the journalists influences their output (M=3.9) to a great extent.

The study established that liberalization of the media industry in Kenya had affected the quality of output and brought new ills such as freedom of media, growth of media and decline of ethics and unqualified journalists and high pay which threaten to kill the profession of journalism. The declining professional identity of journalism can be improved in several ways such as by training, accrediting journalists, journalistic association and emphasizing on the code of conduct.

Conclusion

The study concludes that the professional identity of journalism has changed from what it used to be some years ago. This is attributable to factors such as the advanced technology, training, free press, alternative media such as blogs and social media and influence from politics.

The profession of journalism has been influenced by advances in technology, politics, globalization and commercialization of the field. The study concludes that publication of events depends on its sensitivity, its perceived consequences and its nature (dramatic or exciting)

The alternative media has greatly influenced the profession of journalism. This is more from the on-line journalism and citizen reporting.

The study concludes that the occupation of journalists affects the output of journalists. This includes the position, area of coverage, competition among the media houses, risk and sensitivity of some information, the speed of information transfer and timing of their work.

The field of journalism is greatly influenced by the social aspects of the journalists. This includes education level, professional qualification and the income of an individual.

The study concludes that liberalization of the media industry has affected the quality of output of the journalists. It has brought new ills such as decline of ethics.

Recommendations

This study recommends the following to cushion and repair the seemingly weakening professional identity of the journalism.

- There should be a body to certify and accredit journalists before they are allowed to start practicing journalism in Kenya.
- The government should enact some legal consequences for those who publish and distribute content which is obscene and abusive or offensive to the audiences or morally damaging.
- The journalism syllabus should be reviewed to include more on the profession and integrate the emerging issues.

The management of the media houses should put mechanisms to scrutinize and screen the content before it is released to the audience to ensure that the content is not damaging to the society.

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Media as Opium of Masses: Coverage of the 2013 General Elections in Kenya

By
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Abstract

Media has confirmed to continue wielding influence in the 21st century, and there is no predicted force to stop it. When Karl Marx, a Germany economist and thinker, analyzed the society during his time, he realized that religion was by then so powerful an influence to the society that he despairingly admitted that it was being used to placate masses. If Karl Marx were to rise from his grave today, he would be amazed at the way this role has been taken by the media. This article will argue that media has become the 21st century's opium of the masses and particularly in Kenya, where it has been used consciously or unconsciously to pacify antagonism triggered by polls. This role of media has never been espoused at any other time as it was during the 2013 general elections reporting. The media largely did so by employing peace journalism in their coverage of the elections. This is perilous to a burgeoning democracy, which has not yet learnt to exploit freedom of expression. This article contends that political democracy can be undermined by media if it colludes to pacify the masses the way it did in the 2013 general election in Kenya in the guise of advocating for peace. The article is a descriptive study of the way the conduct of Kenyan media during the 2013 general elections was largely shaped by the outcome of the 2007/2008 post election violence. The article will use some of the significant events that were never reported or were limitedly covered by the media, as data to buttress its argumentation. The term media is used to refer to the mainstream media specifically the leading radio stations, television channels and the newspaper. The other variation where the term will be used will be specific to entities such as social media to mean Face Book and Twitter.

Keywords: Media, opium of masses, Coverage, political democracy, general election

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Introduction

In the 21st century, there is no doubt that media has continued its influential power. The power of media today can be gauged through the eyes of Karl Marx, a German economist who through his critical analyses realised that people were unable to disentangle themselves from the social, political and economic exploitation because religion was massaging their harsh reaction. To Karl Marx, religion had become part of the spiritual oppression that weighed down the dreams of the masses that were already overburdened by continued exploitation by the rich, and were under want and isolation.

Karl Marx's argument was that religion exploited the masses and disempowered them through a belief that there was better life after death. Submission and patience were emphasized, and the masses were supposed to keep hoping for heavenly comfort. This way, religion was termed by Karl Marx as the opium of the masses; a spiritual booze which made the exploited strewn of their human dignity, their human demand and life worthiness (McKinnon, 2005). Interestingly, if Karl Marx were to rise from his grave today, he would be amazed at the way this role has been reversed by the media.

Many communication and media theories have been developed to capture the influence that media wields on the society and its institutions (Hjarvard, 2008). However, the most outstanding fact is that media can be a useful as well as harmful institution to the society. It is mandated to function as a watchdog and voice of the people. In Kenya, the media has gained prominence because of the role it plays to educate and inform the masses.

Kenya was plunged into an unprecedented violence after the disputed 2007 presidential election. In what came to be called the 2007/2008 post election violence in Kenya, over 1200 people died, many thousands were injured and over 300,000 were internally displaced (Anderson & Lochery, 2008; AWC, 2009). The violence saw a massive destruction of poverty where about 42,000 houses and many businesses were destroyed and other property looted. The Commission of Inquiry into Post-Election Violence (CIPEV) led by judge Kriegler compiled a report whose one finding was that the post election violence was spontaneous in some places and was planned in some other places. In areas where the violence was planned, politicians and business leaders from some ethnic communities were accused of playing a role. There were some areas, according to the report, which experienced a combination of the two forms of violence. In some places, the violence started spontaneously with the ODM supporters purporting a rigged election by the PNU, and later this resulted to organised retaliatory attacks (Yieke, 2010). In the Rift Valley Province, which was greatly hit by the violence, some places were expecting violence regardless of the election outcome, and this is where well-organised violence started with communities like Kalenjin and Kikuyu extending the fight beyond election outcome, to what was formally regarded as historical injustice. The members of ethnic groups associated with a rival party were not spared in the ethnic crash that occurred thereafter, and this gave way to untold crimes bordering on the violation of human rights such as burning people who has sought refuge in the church, rape and blatant killing by both civilian and police as they tried to quell the violence.

However, the incidence of the 2007/2008 left the media wallowing under the mercies of critics when it supposedly played a critical role in fueling the post election violence (Nabea 2010, Waki Report 2008). Whether this was intentional or unintentional is not the concern of this paper, but

the underlying factor is that many reports into the causes of the post election violence made some direct and indirect links to the media (Waki 2008, Kriegler 2008, NCIC 2008).

Come the 2013 general elections, the media dropped its watchdog role and took over the flute alongside the government and civil society to preach peace. According to Musa (1996: 89), when the media derelicts its watchdog duty "... [it] largely fulfill[s] the task of sustaining the prevailing social order that has empowered few and disempowered the majority." In the case of Kenya, it was noted that by failing to keep the government and the Independent Electoral and Boundaries Commission (IEBC) responsible for electoral process failures, the media created a situation where injustices could find their way to compromise a process which was supposed to be free, fair and democratic. Musa (1996: 90) observed that, "in this situation the media... remained a conduit pipe for dissemination of ideas and values which confirm and not challenge existing patterns of power and privilege." This way, an institution that was entrusted by the people to play a watchdog role was tongue tied and instead of keeping the government and the IEBC on its toes, it over-trusted the electoral body and the government. Through its influence, the people were soothed and for once, media inadvertently became the opium of the masses. Opium in the sense that it succeeded to cool down tensions and cover up incidences in the fear that it would find itself in the quagmire it found itself in 2007.

The Contribution of Media in the 2007 Post Election Violence

Kenya is constituted of 42 tribes and has been referred to as a model for political stability and economic development in Africa (Yieke, 2010). Although the 2007/2008 post election incidence is termed as unprecedented, Kenya had experienced violence after elections since the introduction of multiparty system in 1991. The 2007/2008 case was just an escalated case because the new media and mobile phones were used to easily mediate the political discussions that were ethnically charged (Nabea, 2010). According to the UN High Commissioner for Human Rights report (2008) the primary trigger of the violence was the supposed irregularities in the electoral process, but there were underlying causes such as discrimination, poverty, disfranchisement and inequalities, which fuelled the crisis to its ultimate heights.

Moreover, Anderson and Lochery (2008) indicate that the historical injustices regarding land resettlement schemes have always caused political violence and tensions in Kenya in all political elections. According to the Kriegler (2008) Commission Report, the media played a significant role in impacting on the level of violence in both negative and positive way. In the same line, Nabea (2010) argues that before 2007 general election, mainstream [and new] media were largely used to stir ethnic hatred, especially the radio stations which broadcast in vernacular where coded language peaked at the height of the violence. Nabea believes that the involvement of media and especially vernacular stations, and their use of innuendoes that were meant to incite ethnic kin, largely contributed to the violence. This standing is believable given that media has an influence in the society and historically, it has been used to initiate conflict.

It is also important to note that hate speech at the time was not the sole responsibility of the media; previously, the politicians had directly used it in government offices and public rallies. Yieke (2010) asserts that politicians are wont of using ethnic identity as a mobilizing factor in their movements. Yieke contends that when ethnic identity is used by politicians in order for them to realize power upon representation of identities, the collective identity becomes a curse to the society and plunges the society into [a state of perpetual] war. In this case, it can be drawn that post election polarization in any civilization is a result of propaganda and ineffective

dialogue whether intentional or unintentional, and this exacerbates tensions every time there is an election.

Politicians and Government agencies in Africa use ethnicity as a political mobilizing factor (Musa, 1996). In fact, this political utilization of ethnic identity is no more than the realization of power upon representations of identities. This is where the stability of ethnic identity in narratives becomes the issue of political representation in claims of militants about ethnicity as a collective identity for a group (Ogot, 1996). In addition to the use of ethnic identity to polarize Kenya and cultivate ideologies, media has also been exploited by politics to hype tensions (Ogot, 1996); as noted in 2007. Before, during and after the 2007 elections, local radio stations in Kenya broadcasted political statements that were not censored from politicians; internet was highly used to broadcast hatred emails and website were created, which were used as avenues for hate speech, not to mention blogs, Facebook and other social media (Nabea, 2010). Mobile phones were also used to circulate short text messages, which were meant to heighten tensions in Kenya. As a result, both mainstream traditional and new media found themselves at the service of men and women, who used them for their personal and selfish way to balkanize the country through ethnic incitement and terror.

Moreover, in 2007 media institutions were locked into the power structure as they acted largely in the interest of the dominant political ideologies and institutions (African Woman and Child, 2009). By taking a position, the mainstream media exaggerated institutional view points and drew tribal political views and assumptions as realities, and failed to give alternative views. The media was polarized and media owners influenced the side that their media took as partisans (Kriegler Report). According to Siebert *et al* (1972), there is a close correlation between media ownership and media control, whereby it becomes difficult for the media to exercise its independence especially in watch dogging its owner's conduct. It was against this fact that the Kriegler report needed media owners to be made public so that the media is censured when it is being manipulated to favour its owner's self interests.

After the media was divided, the country was divided more and on realizing this, the government imposed a ban on live broadcasting on 30th December 2007 because media had failed to manage their broadcasting responsibly in the initial break out of post election violence. The measure temporarily stopped vernacular FM radio stations, which were hijacked by politicians to incite hatred among their ethnic communities. From that point, journalists were called to adhere to ethics and devote their time covering positive news and promoting nonviolence and peace building content. This effort seemed to quell the violence, proving that media was a crucial institution in fanning the violence.

There is no doubt that media was at the forefront in inciting Kenyans during the violence given that among the people later indicted at the ICC, one of them is a journalist; a radio presenter with KASS FM by then; a radio that broadcasts in Kalenjin language. This placed the media at a strategic place in the violence because the accused also constituted of politicians and state officials.

Bases on which Media was to Cover 2013 Elections

After the 2007/2008 post election violence, The Kriegler report, The Independent Review Commission – IREC report and The Waki Report from the Commission of Inquiry into Post-

Election Violence – CIPEV as well as other bodies like the Kenya National Commission on Human Rights, the Kenya Human Rights Commission, the African Union, Commonwealth Observer Group, Comesa and the European Union among others handled their reports concerning the role of media before, during and after the elections (Gaitho, 2010; The Report of the Commonwealth Observer Group, 2013). The reports and findings traced the media role in the 2007 and in their studies, they scrutinized whether media reporting was fair and balanced, its contribution to the ethnic divisions and violence and the measures that could be placed in place to ensure fair, balanced and responsible reporting in the next election.

As a result, the government of Kenya, the civil society and the media led a concerted call to preach peace and entrench peace and reconciliation amongst the warring communities. Media as a powerful mediator in informing and educating the masses was used by the players to bring back the lost glory in the land. These efforts led to the formation of Truth Justice and Reconciliation Commission as well as the ultimate constitution promulgated in 2010. The constitution added to the Kenyan laws such as statutory law and common law that empowered media's freedom of information and freedom of expression. Article 35 of the constitution is a great anchor on which media's freedom is founded especially access to reliable information.

The Kriegler the Waki Reports, whose commissions heard the evidence on the hate speech, found out that vernacular radio stations were used to incite ethnic violence. Most witnesses mentioned Kass FM (that broadcasts in Kalenjin) alongside Kameme FM, Inooro FM and Cooro FM, three of which broadcast in kikuyu language (Gaitho, 2010). In most investigative reports, no witness appeared to accuse these radio stations of broadcasting hate speech (The Media Diversity Centre Workshop Report, 2008). Moreover, the ministry of information did not produce any recorded transcripts of the hate speech. Although this is so, it can not be ignored that media played a significant role, whether consciously or unconsciously, intentionally and unintentionally and some evidence could have been produced elsewhere. For example, the lately released report by TJRC has mentioned Inooro, Kameme and Cooro as having played a significant role in fueling the 2007/2008 post election violence.

As the 2013 elections approached, the issues surrounding the role of media in the electoral process gained prominence. The Waki Commission acknowledged the importance of the freedom of press and media, but insisted that the offensive speech that media broadcasted in 2007 especially from the vernacular radio stations require much attention in future. The media should take its role to self regulate so as to ensure inflammatory speech though their broadcasts are censured and their effect on the masses scrutinized.

The Kriegler report

The Kriegler report recommended that the media council of Kenya (MCK) should oversee the conduct of media and makes sure its codes of conduct is enforced. The report also recommended that the media and elections policy need to be developed so that there are guidelines to verify data and information before it is broadcast. This includes strict vetting of live broadcasts as well as screening of commercial ads. The report also called for training of journalists on the electoral

code of conduct including on the manner in which opinion polls should be reported. In this case, the Kenya broadcasting commission role was to be reviewed so as to prevent the media from being misused by the people in power to advance their personal agendas especially their contact with the presidential pres service. In this case, the disclosure of who owns media houses was to be made public regularly so as to avoid cases where media owners use and misuse their media in advancing personal political interests. The media experience from the 2007 case proves that if election results are scrutinized as they come to the polling station, it can prevent results manipulation, which is the main cause of violence. This means the monopoly of a single source of result announcing is not fit for an aged democracy.

The draft elections bill of 2011

The draft elections bill of 2011 defined the access and media obligation in the electoral period. Article 34 (1) subsection 2 analyses that all political parties participating in an election shall have the state radio and television broadcasting service during the official period of political campaign. This was meant to reduce the inequalities that may disadvantage one person and favour the other with the understanding of the role of media to influence.

Moreover, the draft bill gave the electoral commission the mandate to consult with the political candidates, their parties and the public media on how the broadcasts rights are to be used in accordance with the provisions of the constitution. The draft also guided that every media, print or electronic shall be guided by the principle of total impartiality and refrain from any form of discrimination in space and journalistic favor in the electoral process. These guidelines, among others, were meant to ensure that by the time 2013 elections are taking place, media will act responsibly and their role in educating the masses and advocating for peace is achieved.

Through commercial ads and its own ways, the television, the radio stations, print and even through internet, Kenyans became advocates of peace. The mainstream media journalists and personalities undertook to their expense a concerted effort to advocate for peace before, during and after elections.

Measures to Achieve Peace in 2013 General Elections

From the lessons of the 2007/2008 post elections violence, hate speech, incitement, tribal innuendoes and unnecessary resistance were the causes and fans for violence. As a result, the 2013 election cost the tremendous effort with the Kenyan government and grassroots organisations implementing a nationwide, as well as early response network to quell the violence if it were to break (Lord & Wilson, 2013). There was a Kenyan group that monitored hate speech while political parties required their followers to defend peace. Other groups such as religious leaders and local committees monitored and ensure that any arising tensions were calmed. Moreover, the U. S. Agency for International Development funded local youth movements who educated youths on the need to ensure peace and shun violence under all costs. Kenyans were, therefore, called upon consistently to value peace, ignore political incitements, and notice the hate speech from political circles and any divisive mechanisms that may incite them to fight at the expense of a political rite (Orlale, 2013). The calls to embrace unity in diversity, nationalism and peaceful coexistence were emphasized through media.

During the political campaigns and rallies, the media, in line with the draft elections bill covered all candidates with some noticeable balance although political opinion polls had their influence. In this case, the two leading candidates from the Cord and Jubilee coalitions would carry the front page and precedence in news coverage and then the “others” would follow later. There was a popular opinion among the media and Kenyan population in general that “the political race was between two horses”, a phrase that was consistently faulted by the perceived minor candidates. For the media, having failed in 2007 employed peace journalist and exercised some responsibility, less discrimination in coverage and highly censored their content before it went on air.

The role of media in a democracy

Media is an institution which is traditionally known to represent the interests of the society and it mirrors it as it is (Louw, 2008). In governance, if democracy is a government of the people for the people and by the people; then the media is the cornerstone of such a democracy. This is because media midwives political debate and keeps government committed to accountability as well as keeping the citizenry informed. As for elections, media plays a crucial role to inject credibility by ensuring free exchange of ideas among political parties, the contestants and their platforms, and provide information regarding the electoral process. Therefore, media had a core mandate to act on behalf of the public spirit and constantly informs them of the social, political and economic activities as they take place around the world. In this case, the Media should strive to mirror the society and strive to picture and display the bare truth as well as harsh realities of life.

Moreover, it is the media who should remind politicians about their unfulfilled promises after elections. Excessive coverage of politicians by television helps the illiterate to know who to elect to power and this forces the politicians to be accountable for their promises in future. In this world, there is no perfection and so is media. However, we can not talk of democracy if the media is not active and neutral. Being a watchdog in a democracy, the media keeps the institutions of power and government active.

Did Kenyan Media play its Watchdog Role in covering 2013 elections?

Although the media managed to mediate peace throughout the electoral process, there is actually a big problem in this achievement because the media over-censored itself and forgot about its watchdog role. The media in Kenya did a commendable job to be more responsible, balanced and fair in its coverage, but it abdicated its investigative role by not questioning the Independent Electoral and Boundaries Commission (IEBC) on the electoral process especially the failed BVR kits and the tallying of the presidential votes. When the elections ended and the tallying started, the media had already started praising the IEBC, a commission which was supposed to be handled with suspicion by media in order to deliver credible election (Orlale, 2013). The media, however, kept praising the commission for taking the country through a process of fair and free elections.

Media focus on Africa (2013) argues that after the 2013 electoral process, the Kenyan media received a lot of acclaim from within and without for managing to handle and calm the country during the hotly contested elections. The mainstream media, for example, led the social media in castigating the international and foreign journalists who purportedly came to Kenya with already prepared

templates ready to cover violence. They were met with unprecedented criticism as they were viewed as always having a mindset that Kenya is a warring country whenever there are elections. There were accusations that the template had the stories of violence ready with headlines and only waiting to be filled on when the violence started and who started. The foreign media was accused of muckraking for negative news in a peaceful environment.

A particular video named “armed as Kenyan vote nears” by the CNN that showed heavily armed Kenyans preparing for violence was highly condemned by all Kenyans and media (Mwakilishi, 2013). The report by the international correspondent Nema Elbagir had it that Kenyans were all along preparing for their own protection if violence was to erupt after the 4th March elections. The critics were convinced that this was a false depiction of the Kenya’s situation and that the video could influence Kenyans otherwise.

The role of media to disseminate information is so fundamental that it can direct governance for good or for bad (Louw, 2008). This dereliction of duty can be harmful to a growing democracy. Media has to wake up to the reality that its cardinal role is to ensure free, fair and transparent governance (Louw, 2008). Yet, the Kenyan media in 2013 played an advocacy role to preach peace. Although peace is an inevitable necessity for social order, society faces future challenges if the Kenyan media does not exercise restraint, and continues ranking democracy, radically, second to peace. One very critical point in Kenyan situation was when the social media members broke into a cyber war after the 9th March announcement of the president elect, and when the supreme court delivered its ruling. This was a proof that things were not going on well as the mainstream media was demanding. The suggestion is that the media should evaluate its position so as to balance its advocacy for any political fact so as to attain a sustainable social good.

The unreported failed pilot kit experiment

It all started one week before the elections, when the BVR kits reportedly failed during the public launch by the IEBC. Regardless of the fact that 4 out of 5 gadgets never worked properly during the demonstration held by the IEBC, the media gave the story a total blackout. May be if the debacle was reported, Kenyans would not have put a lot of trust on the kits and would have been prepared for their failure. Thank God the media was there to quell the tension that would follow the massive failure; but it used a lot of resources to do so than it would have done by reporting the experiment failure. This way, it was a dangerous move by the media to fail to expose the outcome of the experiment which was to monitor Kenyan’s democracy.

The Reluctant Journalists

The 2013 electoral process was highly punctuated by journalists who clearly showed their abject withdrawal from covering the realities on the ground. There was a time in the course of tallying when the Cord coalition raised complaints and one IEBC executive officer gave a brief to the media. He only took a question from one Cord member and no journalist posed a question. The Media seemed content with the process and went on praising the IEBC for a democratic exercise. Many Kenyans had a lot of questions, especially concerning the delayed presidential poll results and the failed electronic tallying system, which were never asked on their behalf or answered during the process.

The Electronic Tallying Process and Media Messages

When things started going dim and Kenyans were supposedly losing patience, the television stations and radio stations were awash with peace messages where Kenyans were reminded to be calm and patient (Orlale, 2013). The messages calling them to avoid going back to the dark days of 2007/2008 post election violence were consistently and repeatedly aired. In their clever way, most Kenyans were heard in electronic media and social media claiming that “we want peace, but we want justice” a phrase that is recorded and has been repeatedly played in one of the television channels in their lead signature before news coverage.

The Unreported Mood

Moreover, it was noticeable that media never covered areas where protests struck. For example, after the presidential results were announced by IEBC, there erupted protests in Kisumu from Cord supporters. Moreover, when the Supreme Court upheld the results of the disputed presidential election, reportedly two people were killed in Kisumu and 11 other wounded in an exchange battle between police and protesters in Kisumu. The protests saw shops looted and tires burnt in the city but very little was reported about this mood by the media. While it was mentioned *en passe* by some radio stations and television channels in their news coverage, in print, the story was allotted very small news holes. In some newspapers, no such cases were covered. Therefore, to date very little is known about that protest where people supposedly died. The media largely covered areas in Central and Rift valley where jubilee supporters were celebrating.

The Social Media Reaction

Baruch Spinoza (24 November 1632 – 21 February 1677) held that “peace is not lack of war...”, and this was to be proved later when the social media was awash with attacks where the followers of political sides virtually went for each other’s necks. May be it was because of its anonymity, but it was claimed in the social media that the aggressive politicians who tried to fault the process of tallying were given a “total blackout” by the media. The Cord leader was later to accuse the local media of failing to cover their complaints against the process when he made an evening press briefing after the presidential results were announced and jubilee leader was declared president elect. Although this could be taken as a personal opinion, it was an accusation that many other institutions and experts have directed to the Kenyan media and should be taken seriously.

Argumentation and Discussion

Due to the concerted advocacy for peace under all circumstances, the media and civil society through media managed to cool down and suppress any tension among Kenyans. The media’s watchdog role was at play even as the electoral process went on. Media reported success and consistent will by all Kenyans to exercise their democratic rights peacefully. Due to media influence, voters were called upon to vote despite the earlier speculation that voter apathy might dominate the process.

Through its massive influence, media shapes and frames the process and discourse of political communication and the society in which such process takes place (Lilleker, 2008). This concept, borne of the theory of mediatisation is under test because media has taken advantage of it to drive its agenda. The process of mediatisation is a key concept which raises the fundamental

questions regarding the role of the media in the society and culture of such society. The concept of mediatisation is a success in analysing how media spread to, merged with and inserted its overwhelming influence to other social institutions and cultural phenomena such as politics. The case of the Kenya 2013 elections coverage by media presents a mediatised phenomenon and achievement.

The media emerged as a significant institution that has become integrated into the very fabric of Kenyans social and cultural life (Mazzoleni & Schulz, 1999). Entrusted with the process of keeping the country informed, the media used its power to preach peace alongside government and quell any dissenting opinion which would plunge the country into mayhem similar to that of 2007/2007 post election violence. This was not its role given that media should keep the government and IEBC on its toes. Hjarvard argues that mediatisation includes using of broad conception of media as technologies, institutions and aesthetic forms considering how characteristics of media influences human interactions, social institutions and cultural imagination.

Although Kenya is happy that no violence erupted after the 2013 general election, the peace witnessed is highly attributed to have been achieved at the expense of the watchdog role that is bestowed to media by the public. The media is tasked with the social responsibility to raise concerns about any issue of public concern and governance. The media used its massive influence to placate the Kenyan masses and convince them that everything was well with them. Media is accorded by its very nature and scope of operation critical functions in the society because it largely impacts on human interaction and institutions' relation (Hjarvard, 2008:125-126). Hjarvard distinguished three cardinal functions of media that leads to strong media influence in the society.

First, media constitutes an interface in the relations “within and between institutions” (Hjarvard: 125). For example, a media outlet like a television broadcasts political newscasts and brings them to the rooms of the people. Through advertising, private firms are able to communicate with their potential customers and consumers of their products. Second, media forms a realm of shared experience in which they offer a continuous presentation as well as interpretation of things as they are thus contributing to a sense of identity and community. Third, media helps to create political sphere in which institutions defend their interests and establish legitimacy (Altheide & Snow, 1979). In these three functions, Hjarvard argues that the media logic increasingly affects the society although the extent to which media affects and influences the society varies.

The Kenyan media was noticeably playing these roles before, during and after the 2013 general elections. Political analysts were deployed in almost every media house to give their analytical opinions on the state of the elections, expectations, fears and hopes for the country. The first function and the second function were easily simulated to placate the masses. Excessive self censure as was noted in the case of the Kenyan media can easily lead to misinformed public and skewed and even exaggerated realities. For example, after the announcement of the presidential results, Cord went to the Supreme Court to seek justice. Even when the Supreme Court ruled in disfavor of their petition, social media was awash with anger and wild attacks between supporters of Cord and Jubilee.

The mainstream media reported a celebratory mood throughout the country after the announcement of results. The reaction of the social media shows that this was not a general

feeling on the ground. Moreover, the issue of stolen election has spilled over to the parliament where Cord supporters keep insisting that they won the 2013 elections. Although this is the usual political mood after a loss or a win, the accusations of the losers mourning their loss need not be taken for granted.

The media in Kenya did a good job to accord Kenya a chance to have the much needed peace before, during and after the 2013 general elections. However, Udomsilp (2011) warns that it is unethical and injudicious when media remain a polite space where dissent is swept under the carpet and replaced by a consensual agreed agenda instead of nationalistic propaganda. This is because by doing so, the media lays down its mandate of promoting good governance (Nazli, 2011). The future of democracy should never be left at a vulnerable state as in 2013 because there may be no other chance to escape violations.

In conclusion, although good stories and positive reporting is critical to building a peaceful society, the cases of injustice, suffering and inequality of any kind in the electoral process should be reported. The media should invest much on how Kenyans can develop a sustainable mutual understanding on the issues that divides them instead of covering up the issues. This is of great significance because if the dirt is swept under the carpet, it goes nowhere and when it gets too much, it will have to be brought to the light and the consequences are the results of the 2007/2008 post election violence which was highly associated to the historical injustices that had been suppressed since independence. The case of media in the 2013 coverage of the elections and achieving peace journalism was born of the fact that media was accused of fanning the 2007 post election violence. This history shaped and affected the tone and coverage of the 2013 general elections. The media exercised excessive restraint to avoid raising tensions that could indirectly flare up violence. Although tact and care were necessary in media coverage of the electoral process democracy cannot thrive when the media exercises too much restraint on the institutions of governance.

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Language and the Quest for Development in Kenya: Kiswahili at Cross roads

By

Clara Momanyi*

Abstract

Development as a concept encompasses various definitions. It requires a wide range of activities for it to happen. One such activity is the medium of communication where language can be used as a tool for development. The level of development in any given society can also be measured by the way its members use language to achieve economic, social, political and cultural advancements at any given time. There is therefore close relationship between the language of communication and the economic development of a given society. Hence, language can promote or impede the socio-economic development of a country depending on policies that are put in place and the political will of its leaders. In Kenya, Kiswahili has been the national language since the last century but there is little to show especially on its role and status in the multi-lingual Kenyan society. The Constitution of Kenya (2010) recognized Kiswahili as the first official language of the Republic, followed by English (Chapt.2 Section 7). However, even with this constitutional dispensation, Kiswahili still faces challenges due to various reasons, some stemming from its history. The article discusses some of the challenges that Kiswahili experiences in its new status and interrogates the role of the Government of Kenya in anchoring Kiswahili not only as the national language but also as one of the official languages in the Republic. The article also offers suggestions on the way forward as well as the role that this language can play in the political, socio-economic and cultural development of Kenya.

Key words; development, national language, socio-economic development, Kiswahili

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Introduction

Concept of Development

Development is a process of improvement with respect to a set of national values. National development on the other hand, is based on a nation's cultural uniqueness which is the foundation of that nation. Do Kenyans have a unique cultural manifestation that makes them unique? What are their values? Since language is an expression of a particular culture and a vehicle through which that culture is transmitted, what then is the role of Kiswahili as a national language that is expected to transmit our Kenya's national values? How far has Kenyans embraced Kiswahili as a vehicle of transmitting national culture? This article seeks answers to these and many other questions that are seldom asked when it comes to the role of this language and development.

The world's great thinkers emphasized the self as the force behind man's development. For example, Thales taught about 'knowing thyself, and Shakespeare stated, 'to thine own self be true'. On the other hand, Ghandi reminded us that 'you must be the change you wish to see in the world.' This, coupled by words touching on the self from Barack Obama to the effect that 'It's only when you hitch yourself up to something bigger than yourself that you're going to realize your true potential, and the world will benefit from that potential' assures that the self in us is the driving force towards development. We can therefore rightly state that development is a human-oriented term and that it should be associated with all aspects of human life (Abagi 1994:44).

Development also includes the right to exercise one's linguistic, cultural and political liberties. Huntington (1996:59-67) clearly states that 'the central elements of any culture and civilization are language and religion...' Indeed these are the elements that enable us to express our inner feelings, our aspirations, our fears and our vision. They are the elements that tell who we are in any part of the world. As Prah (1993:18) also states, development is a cultural phenomenon. It is should not only be associated with physical structures since these are the manifestations of development. Development is people driven. Society is thought to be developed when it is able to take care of its members in terms of health, nutrition, shelter and education. It is also when it creates opportunities for its members to earn a fair reward for their labours and also enable them to participate in decisions that affect their lives. Society is thought to be developed when it also takes care of those that are vulnerable and disadvantaged while at the same time respect the civil and political liberties of its members. In all these elements of development, where is the place of language?

Language and Development

Language and development have shared boundaries, that is, they are coterminous. Disciplines such as physics have been used from time immemorial for human development in the world. However, a discipline like physics is governed by cosmic laws while language is governed by human beings that inhabit the cosmos. Hence language can be harnessed for purposes of developing and maintaining the cosmos where we live in. Any country that values the development of its people must incorporate them in that development. This can be realized through a language that they can comprehend and can competently use it to evaluate themselves and to implement development projects within their area. Citizens must be empowered to participate in the governance process through a medium of communication that is common to the majority. Hence, failure to incorporate the language factor in a nation's development agenda can affect the overall development.

The rationale of using African languages for national development is that in almost all African countries, these are the languages that the majority of citizens use to boost food production, to

produce goods in factories as well as to transmit knowledge and information. It is a fact that Kenya, for example, continues to face a challenge with regards to improvement of rural economies especially in communicating new ideas and innovations due to language barriers between change agents and rural communities (Rono, 1997). Attyang (2002:296) concurs with this by stating that development agencies often appear to 'talk down' to communities. They go to them with technologies that are usually packaged in foreign languages that the communities cannot comprehend. These prescriptive tendencies do not favour communities and are less likely to be successful. This can impede development since such languages exclude the majority of citizens in decision making processes. Such technologies and innovations needs to be interpreted in the indigenous language(s) so that communities especially in the rural settings can adopt and use them. Without the functional aspect of language of the target community, such technologies will not adequately help to harness development. In most African countries, the use of colonial languages in most official government functions, to some extent, impede development because not all citizens understand them. These languages are held in high esteem and if one cannot read and write the official language (mostly a foreign language), one is deemed illiterate no matter how literate one is in one's mother tongue (Brock-Utne, 2007).

It is often stated that no country can develop fully through using a foreign language. In this age of rapid globalization and imported technologies, foreign cultures continue to bombard most African countries under the guise of development. Globalization being a radical change that has taken place in world economies, has brought with it neo-liberalism. It has opened national borders to allow unrestricted movement of capital, goods and services, hence denying poor people to use protectionary measures (Brock-Utne and Garbo 2009:5). Such measures include the use of indigenous languages for purposes of reaching out to the majority with respect to globalization influences. It is imperative now for African countries to start reclaiming their languages and indigenous knowledge in order to interpret globalization and to harness development in all spheres. African languages can successfully be used to bring about faster development because foreign technologies can be interpreted, understood and applied with much ease compared to the use of foreign tongues.

Kiswahili and Development in Kenya

According to Mulokozi (2003:73), Kiswahili is one of the three African indigenous sub-continental languages. The other two are Hausa and Arabic. Indeed, Kiswahili is the African lingua franca which has over 110 million speakers, and the number is still rising due to its spread in other world countries especially in America, Europe and the Far East. In the East African region a great deal of trade is conducted in Kiswahili especially in Kenya and Tanzania. These countries embrace Kiswahili as their national language. In Kenya, for example, the language is the social lingua franca of the majority of Kenyan population at all socio-economic levels according to Kimemia (2001:12). It is the language of inter-ethnic communication in the country as it cuts across ethno-cultural barriers. It is not ethnic specific and its contribution as a development tool cannot be overemphasized. The language can also be used to encourage social integration and maintenance of peace required for development. This was realized especially during the post election violence of 2007-2008 where the language played a pivotal role in uniting the different ethnic communities for peace through discussions and dialogues. Historically, Kiswahili is the oldest African language in this part of the world with a written literature that can be traced back as early as the 16th century. It is purely a Bantu language which has a high percentage of borrowed lexicons from other African languages and foreign languages like Arabic. It has a wide variety of dialects which spread along the east African coastline,

although some of them may be extinct or near extinct due to various socio-cultural factors. Research therefore needs to be done to determine which ones are nonexistent due to lack of indigenous speakers.

Because of its neutrality, Kiswahili has continued to enjoy the support of East African governments although during the colonial era especially in Kenya, the language was not given prominence. Right from the Beecher Report of 1949 to subsequent commissions like the Ominde Commission of 1965, Kiswahili was not favoured in education. Children in lower primary schools were encouraged to learn their mother tongues but with little Kiswahili which was not examinable in national examinations. Kimemia (2001:89) also states that the controversies that have surrounded the national language policy in the colonial and post-independent Kenya have adversely affected both the learning and teaching of this language. He opines that these are policy contradictions which have continued to subordinate the status of Kiswahili in Kenya. It was not until 1984 following the Mackay Commission that at least the language became a compulsory and examinable subject in primary and secondary schools throughout the Republic. Although the move by the government of the day boosted the image of Kiswahili in the country, a large population of Kenyans who never learnt Kiswahili in school in the early days was already disadvantaged by the system. Hence today we have a huge mass of Kenyans, especially those that live in rural upcountry, who are not very competent in this language.

However, Kiswahili still remains a powerful instrument in the promotion of harmony, unity, solidarity and a sense of belonging in Kenya. All these attributes are needed for the development of the country. It has continued to be the language of cross-border trade in the East African region and among various Kenyan communities as they engage in trading activities. Kiswahili is now spoken and understood by over 80% of the population in Kenya, and has multi faceted roles as far as development is concerned. It has been for a long time been used by politicians to woe voted during political campaigns where literary genres especially poems and lyrics are used by artists on behalf of campaigners. Activities such as voter education at the grassroots level employ Kiswahili to be able to reach out more people. Human rights awareness, alcohol and drug abuse campaigns are able to create impact through the use of a medium that is understood by the majority of Kenyans.

However, much development would have taken place in the rural areas if professionals like engineers, clinical and agricultural extension officers, technicians and projects implementers could embrace Kiswahili as they discharge their duties. Some of them are not competent enough to use Kiswahili. Hence, they prefer to use English to the detriment of their policies and goals. According to Prah (1993:19), the process of scientific and technological knowledge generation in Africa and elsewhere in the world must also be seen as a process that empowers the masses. This can indeed take place realistically in their languages. Hence, using Kiswahili which is the language of the masses can empower the latter for development. In Kenya, this problem can be eased if education curriculum developers, especially in training colleges and universities could teach Kiswahili as a service subject or teach the language for special needs. A lot more development can be realized if the functional aspects of this language that is spoken by almost all citizens could be taken into consideration. This would mean that officers on the ground will be able to communicate their skills, knowledge and ideas in the language of the majority. This will ensure effective and sustainable services are provided to the rural populations for faster development. It is therefore imperative to equip local languages like Kiswahili with technical and

scientific terminologies so as to perform these social and economic functions for purposes of development.

Kiswahili at the Cross roads

Education is a prerequisite for economic development and production of national wealth. It is a fact that for centuries now, African languages have been the central driving force for the continent's development. Through these local communication channels, people conceptualize education as a process that empowers them. According to Were and Amutabi (2000:107), national development is an inward looking process which exploits domestic resources to satisfy the local population and borrows resources abroad only to facilitate the local development endeavours. In the above statement, we can also take language to be a vital local resource that a nation can use to satisfy the quest for development. Kiswahili, therefore, can be that resource. It can be used to satisfy peoples' desires and instill a sense of unity among them. This can help bring about development.

However, the language that played an important role to liberate the masses for independence in 1963 is now being faced with challenges. Kiswahili is now at cross roads because as it develops to face the forces of globalization and with it popular culture and foreign ideologies, its speakers are left to wonder whether it can still be used as a tool for development. The emergence of varieties of non-standard Kiswahili such as 'sheng' and 'engsh' threaten the literary and educational sphere in Kenya. Sheng derives its name from the fact that the variety uses English words or a mixture of English and Kiswahili or other African languages to form sentences whose basic grammatical structure is Kiswahili. Hence, the origin of the word 'sheng' is the use of Swahili and English words at the same time. On the other hand, 'engsh' is where the grammatical structure of a sentence, for example, is English while the words are a conglomeration of Swahili and English words or morphemes of both languages used together to form words. Sheng is mostly spoken by the youth especially in urban centres but the variety is now picking up even in rural town. It is not the intention of this article to delve into the origins and spread of these varieties, but suffice it to say that they are infiltrating the teaching and learning of both Kiswahili and English in schools, colleges and universities.

Students and pupils are at a loss. They cannot distinguish which variety; sheng or standard language to use in different social contexts. They are, indeed, at cross roads including some of their teachers who seem not to draw a line between the variety and the standard form of the language in question. The Constitution of Kenya (2010) Chapter 2 and Articles 7, 44 and 56 together with the Fourth Schedule Part 1 (5) provides for the language policy as a function of the national government. Furthermore, the Constitution of Kenya (2010) Chapter 2 and Article 7 makes Kiswahili the first official language of the Republic of Kenya. However, since 2010, there has been no legislative and policy framework in place to address the official position of Kiswahili. Kenyans are at cross roads as far as the use of Kiswahili as an official language is concerned. The status quo still remains. The elite are even more comfortable using English than Kiswahili.

The newly acquired status of Kiswahili also will have some challenges. The Government will have to commit resources and expertise needed to translate basic literature including government policies and other important documents into Kiswahili. This needs to be done because citizens now have their constitutional right to choose either to use Kiswahili or English to serve or to be served in public institutions. This also calls for the education system to be re-examined so as to take on board the acquired new status of Kiswahili. Many private schools and tertiary institutions

use English as the medium of instruction. Some parents, especially among the elite in Kenya has a tendency to regard competence in English language as a necessary condition for academic excellence among their offspring. Kiswahili continues to be faced with challenges arising from long born attitudes about its status. As an official language, what will be the role of Kiswahili in educational institutions? The education sector will need to examine the Kiswahili syllabi from primary right up to university so as to make it mandatory for any learning institution in the country to teach Kiswahili. These are some of the challenges that come with the new status.

On the other hand, we are living in a world where technology and commerce are the main globalizing forces. In these processes, English is used as one of the global languages. The latter is an international language whose power permeates and controls small economies mainly in the developing world including Kenya. There has been a tendency to perpetuate and strengthen the dominant languages especially in Africa and in this case the former colonial languages. There has also been a tendency especially among African intellectuals to revive the indigenous languages and harness them for development. However, in Kenya this is yet to happen since there is no sound language policy in place at the moment to propel this thought. Let me state here that Kiswahili is a fast growing language globally and its role in the development of Kenya and Africa in general should not be underestimated. Opponents of Kiswahili continue to use an outdated fallacy that Kiswahili is not yet scientific enough to be used in the education sector in Kenya. While English is highly commodified in Kenya, the citizens are yet to uncover the benefits and commercial values attached to Kiswahili. To unlock this potential, Kenya needs to acknowledge the role of Kiswahili as an economic asset. The country is still at cross roads as far as the global role of Kiswahili is concerned.

Kiswahili is also at cross roads in relation to the terminologies that are evolving everyday as a result of technological growth. This phenomenon has led to indiscriminate borrowing from the English language purportedly to fill a lexical gap. Let me state here that there is no language in the world that is not able to name things or fill any void resulting from new technology. Its speakers are able to name objects, concepts and ideas through coinage, borrowing from within its dialects or other neighbouring languages or even observing the functionality of certain objects to be able to come up with a vocabulary in that language. Kiswahili is rich in lexicon especially from its vast dialects. There is no point in borrowing heavily from English whereas certain terms or words exist in this language. The following examples can help shed some light:

<u>English</u>	<u>Borrowed</u>	<u>Existing Kiswahili Word</u>
Organization	Organaizesheni	Shirika
Alcohol	Alkoholi	Kileweshi/Pombe
Tray	Trei	Sinia
Phase	Fezi	Awamu
Protocal	Protokali	Itifaki
Headquarter	Hedikota	Makao makuu
Half caste	Hafukasti	Chotara

From the above examples, it is evident that Kiswahili speakers are over relying on English to provide an easy way out while Kiswahili as a language has the required vocabulary when it comes to certain words. It is also important to note that a conglomeration of coined words with no particular order and with many synonyms popping up everyday confuse children trying to learn Kiswahili and discourage them, making them dislike the language.

The media in Kenya has also exacerbated the problem. The rampant use of conflicting vocabulary, sometimes out of context, creates confusion to the readers and listeners. The most affected are school children. They get confused and do not know which words to use in what context. They are also at cross roads, including their teachers especially those in primary school level because they believe the word that the newscaster has used, for example, is the correct one. Lack of policy guidelines has made the situation worse not only in schools but also in all sectors where Kiswahili is used in official functions or activities. Lack of any institution or body to oversee the development and use of Kiswahili within the country has made it difficult for people to learn Kiswahili. There is no body that is charged with standardization of terminologies and vocabularies that are being invented by the populace every day. Hence some people take advantage of the lack of policy guidelines to invent and use any vocabulary, including sheng words as long as they can communicate. Some of the Kiswahili dictionaries being published nowadays also tend to 'go sheng' as some of the items are directly drawn from this variety. An interesting example can be found in *Kamusi ya Kiswahili Sanifu (Toleo la Pili 2004)* where sheng words such as 'Buda' (Kiswahili: baba - father), or the word 'cheki' (Kiswahili: angalia/tazama – check/look). I am not alluding that sheng cannot be used to generate words that can enrich Kiswahili, but my concern is how such words find themselves in dictionaries which are supposed to be standardized instruments of learning a standard language.

In conclusion, let me state here that the ideal role of any language in any given society is to be able to serve as many of its speakers as possible. This being the case, the infiltration of certain words either directly borrowed from other languages where there is no situation warranting this borrowing or coined words that do not observe grammatical rules and structures of the receiving language not only confuse the speakers but make it difficult for it to be learned or taught in an organized situation like a school.

Recommendations

The Ministry of Sports, Culture and Arts is in the process of formulating the Languages of Kenya Policy and Legislative framework. It is hoped that when these important milestones are in place, the role of Kiswahili as an official language will be clear and Kenyans will abide by the policy guidelines.

There is need to improve confidence in the use of Kiswahili among Kenyans because the language is an important and relevant tool for communicating scientific and technological information, including government policies and directives for faster development.

Rural development strategies will only be successful through the use of indigenous languages including Kiswahili. It will depend on how these languages will be utilized to bring about positive socio-economic development in the country.

Promoting the use of Kiswahili as a national priority will enable both the educated elite and the majority of the under-educated to share a common language, culture, consciousness and common commitment in national development (Kimemia 2001:96).

Kenya's economic advancement cannot be successful and effective if the country cannot deal with lingua-cultural issues. Peoples' total participation remains elusive due to linguistic barriers and negative attitudes towards the use of Kiswahili.

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Social media and Information Sharing among Children in Rhonda Slums, Nakuru County Kenya

By

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Abstract

Rhonda slums constitute one of the twelve estates in Nakuru County Kenya with households numbering 8-12. The population is large and does not have a credible reading culture. Information and news are not found in this area (KCB, 2009). There is only one public primary school (Rhonda Primary), fifteen Early Childhood Development (ECD) Centres and without a single Public Secondary School. The only public Library equipped with social media technologies (Kenya National Library Services) is five (5) Kilometres away. Use of mobile phones has been embraced by Rhonda community. This study aimed to explore the extent of access to the mobile phones by the ECD schools. The objectives of the study were to; establish the kind of information the children access from mobile phones, establish how the children share the information got from mobile phones with others, examine the challenges faced by the children in Rhonda Slums Nakuru, Kenya in sharing information with other remotely located peers and suggest possible recommendations. The researcher with the aid of the teachers had children in one ECD (Shabab Friends' Nursery School) in Rhonda slums Nakuru Municipality Kenya had their hands on mobile phones and let them use the cell phones freely. The teachers and the children interacted freely to establish what information the children access and share using mobile phones. Photographs were also taken to show the extent the children can handle the phones on their own and what they can do with them. The findings of the study were that early childhood development school going children are aware of some of the information they can share with other children through the mobile phones but they are unable due to limited and unavailable air time. This study concluded that children in Rhonda slums, Nakuru municipality Kenya are capable of harnessing the opportunities brought by social media in sharing information with their peer if only they are granted the opportunity. The study therefore recommends that the Kenya governments should ensure that the levies charged on airtime are affordable to all the citizens irrespective of their economic capabilities.

Key words: Access, Early Childhood Development School, Information Communication Technology, Mobile phones' Slums, Social media

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Introduction

Many developing countries are struggling to improve the effectiveness of their access to information by making social media available to the poor at their initial development stages. Social media can provide information and knowledge which are crucial components in developing reading skills among children. Social media promises access to huge amounts of useful information to children (Harris, 2004; Murillo, 2007). The children therefore need to be equipped with the skills, values and attitudes they need to survive in this time where our world is changing to convey information through social media (Pandey, 2004). These media include radio, television, Internet and telephones among others. Other than the traditional communication through the telephone, mobile phones can also serve most of the functions of other social media like access to Internet, alphabet symbols that are very crucial in helping children build words, numbers for the development of capabilities of working with numbers in varied fields of knowledge, games that are educational while serving as recreational component to the children, music for entertainment,

The development of the National Information Communication Policy in Kenya is a boost to easy sharing of information via the social media. About four mobile telephone providers have been licensed to render their telephone service in conveying information. Children in Rhonda slums need to share information that is very important to develop their reading and learning skills. Such sharing of information can lead to development of literacy in children who have not developed love for reading. Mobile phones can be a good communication tool where children can share information with their peers. They can use the phones to send and receive messages. They can also use them to serve as a tool to enable them masters their alphabet and numerals using the letters and numbers inscribed on the key board. Word building can also be developed from these letters leading to rich sentence construction. Mobile phones can also play the role of time keeping. Mobile phones have radios which children can either listen to music, stories and other talks by other children. They may contain educational games which can include blocks; logo and other games that can enable them develop their creative skills. Through the mobile phones, the children can appreciate sharing information with others in remote locations

Statement of the problem

Rhonda slums constitute one of the twelve estates in Nakuru County Kenya with households numbering 8-12. The population is large and does not have a credible reading culture. Information and news are not found in this area (KCB, 2009). There is only one public primary school (Rhonda Primary) and fifteen Early Childhood Development (ECD). The only public Library (Kenya National Library Services) is five (5) Kilometers away and does not use social media in developing literacy among children. Among all the households that own mobile phones, the phones are only used for limited communication purpose by the adults. This is because the community uses the limited funds to buy the most immediate needs like food and pay rent. Children in these households are not allowed to have access to the mobile phones because their parents have a notion that the children would damage the phones. Parents who own such phones do not know how else these phones can be used as a tool to develop sharing of information among children. This study aims to explore the extent of access to the mobile phones by the ECDs and suggest possible kinds of information that children can share using mobile phones.

Objectives of the study

The objectives of the study were to:

1. establish the kind of information the children in Rhonda ECD access from mobile phones
2. establish how Rhonda Slums ECD children share information with others through the mobile phones
3. examine the challenges faced by Rhonda ECD children in Rhonda Slums Nakuru, Kenya and
4. suggest possible recommendations

Research question

The specific research question that guided the study was:

How do early childhood development education children use the mobile phones owned by their parents in developing their reading habits?

Significance of the study

The result of the study gives an insight to the Early Childhood Schools administrators and policy makers on how information shared on mobile phones can inculcate good reading habits among children attending early childhood education. On the practical value, the findings would serve as reference point to the parents and teachers of children attending early childhood education on the capabilities of mobile phones in sharing information among the children. The findings would also enlighten the early childhood schools in order to address the need to embrace mass media in reading. Besides, the findings of the study would also benefit the Kenya Institute of Education with regard to syllabi development that need to incorporate social media in reading lessons.

Assumptions

The study was guided by the following assumptions:

1. Mobile phones are a reliable and accurate tool for developing good reading habits among children attending early childhood education.
2. Children who attend early childhood education access and share information with other children using social media.

The scope of the study

The study included a sample of one early childhood education school in Rhonda slums, Nakuru Municipality Kenya. It focused on the tasks that mobile phones can perform for a child at the level of early childhood education. The parents, teachers and administrators of the sample school were the participants in the study. They provided information on the available mobile phones that the children can use to develop their reading skills.

Limitations of the study

The study was limited to the use of mobile phones in early childhood education in Rhonda slums, Nakuru County Kenya. These findings cannot be generalized to all other social media. Some potential participants were not readily available due to their busy schedule of series the of activities Rhonda slums dwellers engage in to earn their daily bread.

Methodology

Research design

The study was a case study conducted within the qualitative and quantitative paradigms. The qualitative approach was chosen due to the explorative nature of the study which aimed to describe the role of mobile phones in sharing information among children. A major distinguishing characteristic of qualitative research is the fact that the study involves asking a group of people questions on a particular issue (Gillham, 2000; Mathooko, 2011).

Area of study

This study was conducted in Rhonda slums, Nakuru Municipality Kenya. Selection of the area was based on the following. Firstly, Nakuru town has been singled out as the fastest growing town in Kenya. It is a tourism attraction area that should be considered in sharing information among all nationalities that visit the town. Menengai crater and the flamingoes of Lake Nakuru both tourism attractions to both local and international tourists are located in Nakuru. Rhonda slums are located to the south of the town with fifteen (15) ECDs. The main means of media communication is through mobile phones.

Study population

Data was collected from parents of the children of Shabab Friends Early Childhood School in Nakuru municipality Kenya and their teachers. The administrators of the school were also participants in the study. This was based on the fact that these are the people who constitute and represent the interests of children.

Sample and sampling techniques

Non-probability sampling was used namely convenient sampling. Shabab Friends Early Childhood School in Nakuru Kenya was readily available to participate in the study (Kasomo, 2006). The respondents were all parents of Top Class in the school. These included 35 parents and 2 administrators of the school. 3 teachers also participated in the study.

Instrument for data collection

Interviews were conducted with the aid of interview guide in the form of semi structured and open ended questions. The researcher used semi structured questions to specifically seek information on the available mobile phones and their usage in the development of reading habits and sharing of information amongst E CD School going children. The administrators were interviewed to establish whether they communicated with the parents using mobile phones. This demonstrated the possibility of the children having access to the mobile phones. The researcher with the aid of the teachers had the children in Shabab Friends' ECD School have their hands on mobile phones and let them use the cell phones freely. The teachers and the children interacted freely to establish what information the children accessed and shared using mobile phones. The researcher visited the interviewees in person and administered a friendly and simple face to face interview. In cases where the interviewee did not understand and communicate in English, the researcher translated the questions in Kiswahili.

Methods of data analysis

Data was collected and classified according to the objectives they addressed. Text and tables representations were used to explain the data. Photographs were also taken to show the extent the children can handle the phones on their own and what they can do with them.

Findings

All the thirty three parents of the top class children in Shabab ECD who participated in this study use mobile phones. All of their children know that mobile phones are used for making calls



Figure 1. Shabab Friends ECD Top Class listens to their teacher

Out of the 17 children who know that the red button is used to switch on the mobile phones, only 2 can switch on as demonstrated in figure 2.



Figure 2: Pupil shows others how to switch on mobile phone

Kinds of information that can be shared using mobile phones

The children in Shabab ECD, Rhonda slums Nakuru Municipality Kenya are aware of some of the information that can be accessed on mobile phones as shown in table 1.

Table 1: Available information on mobile phones

Type	Frequency	Percentage
Games	17	51
Songs	12	36
Calling	33	100
Calendar	10	30
Photographs	17	51
Messages	2	6
Radio	12	36
Time	5	15

Table 1 shows that 17 (51%) of the children know that they can play games and take photographs from the mobile phones owned by their parents. The table shows that 12 (36%) of the children know that they can be entertained on mobile phones through songs while 12 (36%) know that radio is available on mobile phones. The table has also revealed that only 5 (15%) of the children know that the phones owned by their parents can be a good tool for time keeping.

The findings of the study revealed that Parents switch on radio for their children except one child who can switch on the phone on herself. Figure 3 indicates that children hardly get the opportunity to handle the mobile phones owned by their parents.



Fig

ure 3: Children excited over the mobile phone and camera

Given the opportunity, the children identify the alphabet on the mobile phones. They can write their names using the alphabet on the phones. Although they know that the phone is used to send money, they do not know how it is done. This is because there is a private number the children know that it is only known by their parents. The findings of the study also revealed that the ECD education in Rhonda slums Nakuru municipality Kenya do not know face book and what it does

Other available social media in Rhonda slums

The participants in the study revealed that they do not know a mobile phone can serve the functions of a computer to access Internet. They were not interested because they felt that it would be a waste of their air time given that they had more important needs they need like food and shelter.

Discussion

Rhonda slums dwellers' children like any other children in Kenya and in the world at large need to access social information through mobile phones in order to share their experiences with their peers. The need is as a result of social benefits that are influenced by information.

Extent of access to mobile phones

Access to mobile telephone by children from Rhonda slums Kenya is reasonable although the children are denied opportunity to explore the types of information they can share with other children using the phones. The community does not know that there are many features on the phones that transmit information to their children. This has denied children a positive start on sharing information.

Factors that hinder access to mobile phones

Majority of Rhonda slums dwellers do not allow the children to handle their mobile phones because they (parents) are not even aware that there is any valuable information that the children can access from the mobile phones. Again, the cost of air time for the phones to the Rhonda slums dwellers is too high for them to afford. The slums dwellers want food and shelter before anything else. Their income does not allow them to pay money for air time or Internet service as required for them to generously share the use of phones with their children

Improvement of access to mobile phones

Various proposals have been put forward by Rhonda community on how they can share their mobile phones with their children in sharing information. One key proposal is that they want costs incurred in accessing information via telephone for social information completely removed. They want to access their mobile phones at no cost just like they do to the television. They want their children to be informed just like those other children from able communities do. They too want to change with the changing times where children can interact with others from different remote location.

Conclusion

Information shared on mobile phones can play a big role in developing the social being among the children. Children from able communities that have managed to interact with other children through social media like mobile phones have substantially had access to a wide range of information that can be timely and relevant to their reading development. Although Kenya government has licensed four mobile phones companies to provide the service to all, parents from Rhonda slums will only be motivated to allow the children use their mobile phones freely when the air time charges are completely withdrawn

The study revealed that there is relatively no evidence to show that Rhonda dwellers are aware of the importance of mobile phones to their children. For example knowledge on existence of valuable information on the mobile is missing. The major challenge is, the community is not fully informed on the features and what they represent on their phones. They do not know that other than communication, other aspects of learning that their children need can be found on the mobile phones.

Recommendations

The study has revealed that Rhonda community has access to mobile phones. The community other than accessing news from the mobile telephone media can also get to know other capabilities of the phone that can deliver other useful information. With regard to their children undertaking early childhood education, they can therefore be exposed to other information required for the development of their children. The mobile telephone media can also expose

them to lifelong reading habits which are easily achieved when inculcated from an early age through the encouragement and development of a love for sharing information on mobile phones for leisure. The children should be given time and opportunity to develop their skills using the mobile phones. The control on usage of mobile phones by children should be minimized.

Today, cultural change to focus on ICTs is inevitable. The community should go a mile further and embrace the technology because information is available in both the traditional printed and electronic formats. This can present an environment where reading is presented as enjoyable. This is possible since the research has demonstrated that the community accesses media like mobile telephones.

Generally, there is need to harness the opportunities brought by mobile phones. This should be considered as a welcome development to initiate media among the children. They may be avenues where the children may access information through browsing facilities on different subjects as well as keeping them entertained.

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Relevance of ICT in research, publications and library services in learning institutions

By

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Abstract

Modern scenarios place Information and Communication Technology (ICT) as principal enabler in nearly all functional efforts including sustaining quality in learning institutions. Studies have revealed that research has a feeder effect on the quality of knowledge that fulcrums learning institutions principles thence it attracts significant investments. These research efforts are captured and documented in publishable context for availability to knowledge consumers under a more structured system, the library. Universities take lead in fronting ICT-enabled technologies not only to supplement but also to boost primary agenda. Our study focused on unearthing the phenomenal role of ICT on these three principal foci; Research, Publications and Library Services in relation to Learning institutions. We took consideration in appreciating the connection between the three focal areas centered on stakeholders' interests. However, despite learning institutions traditional definitive texture, its universal agenda is to discover, avail and preserve consumable knowledge, which in principle rhythms with our study focus with ICT being the facilitation operand. We eventually proposed a functional framework that picture the longitudinal role of ICT in promoting Learning institutions as underpinned with ICT at its bedrock i.e. hardware, software, protocols, data, and policies. Our work further identified other potential gaps that need to be explored further. We agreed eventually that Library Services had feeder link with Publications and Research efforts which are improved by engagement of ICT impacts.

Keywords: ICT, Research, Publications, Library, Learning institutions

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Introduction

Philip Zimbardo once captured it well and by saying that academic success depends on research and publication, he qualified their significant role in learning institutions. The Berlin Declaration on the Social Dimension identified research as one of the central pillars of well-performing learning institutions system. Libraries on the other hand have been for a long time the legal depositories of scholarly researched publications [1]. The main aim of research is completed through publications. The library complements it by systematically storing such research publications for wider access. Information and Communication Technology, ICT, with its technological aspect improves the traditional avenues towards availing research publications for ease in retrieval and management [2]. Fundamentally, developments in ICT have made significant impact on all spheres of human life. The impact has been rather prominent in case of service activities such as banking, health, transportation, education and libraries. ICT efforts in these services can be broadly explained in terms of economy, ease, extension and efficiency. Library is a major component of any education system [3] [4]. The magnetic term ICT has visibility in all corners of the global arena and has been incorporated in organizational, managerial, developmental and marketing sectors. The services rendered with the help of ICT are faster and more effective [8]. ICT and digital revolution has taken on the world of publishing through paperless or electronic publishing. ICT has brought the world closer together by improving the dissemination of knowledge, acceleration of research, stimulation of innovation and facilitation of collaboration [6]. Besides research and publications, ICT has considerable impacts on learning institutions in other facets like teaching, content development, knowledge dissemination options and as a feedback mechanism to curriculum engineers [9] [10] which has played major positive impacts in education sectors for both students and scholars community.

Research Objectives

The objectives that this paper concentrated on were;

To Review existing literature and related work that has been done by fellow researchers to bring understanding of intended research study

To Identify and explore respective roles of ICT in Research, Publications and Library in Learning institutions

To Co-relate Research, Publications and Library as underpinned by ICT as applies to Learning institutions

To establishing connection existing between Research, Publications and Library as underpinned by ICT in learning institutions

To propose Framework for ICT Impacts on Research, Publications and Library in learning institutions

Literature review and related work

Several works has been done in understanding the role of ICT in learning institutions. While casing the Canadian scenario, Kamal and Thahira (2010) concentrated on studying ICT impacts on teaching, learning and assessments using CAI package. Their work was more inclined towards seeing ICT as an agent of educational change especially concentrating on the facets of

teaching, learning and assessments. Similar study was conducted by Ron Oliver (2002) in Perth, Western Australia where he explored the impacts of ICT in relation to what is learned, how student learn, when and where student learn and emerging issues like expansion of teaching and learning constituencies. In assessing the impacts of ICT on learning institutions in Southern Africa, Cheryl et al concentrated on impacts of ICT infrastructure [11] where the results showed that despite infrastructural constraints and organizational challenges, considerable improvements were evident on learning institutions, varied institutional contexts notwithstanding. More evident was enjoining collaborative efforts towards research projects and sharing good practices as an optimization option for the benefits of ICT in learning institutions. Maureen Jackson [12] on her work weighted impacts of ICT on further education (FE) as a superset of learning institutions where despite little coherent strategy in FE, majority of students experience difficulties in locating, accessing, evaluating and using information effectively. Most research studies lack comprehensive exploration on roles of ICT on research, publications and library. Research is treated in regards to finding information by use of ICT resources like online services for teaching and learning purposes, publication is touched as use of ICT to broadcast or advertise contents like in web advertisements and library is more towards online repository at the expense of the traditional library premised on physical infrastructure.

In this section, we explored the three research foci areas; research, publications and library in relations to integration of ICT. Research was viewed as more of discovery of knowledge as its systematic functional approach relies on phase by phase flow. Publications are understood here by the researchers as more of compacting discovered knowledge in a format that can be consumable. Library is considered to be a functional reservoir in regards to consumers' convenience and satisfaction. In all these key foci, ICT is agreed to be one principal driver towards realizations of their goals. A co-relationship that joins the three research concentrations was also arrived at later.

Research: Knowledge Discovery in Learning Institutions

Research is understood to mean conducting systematic investigation in an existing or new knowledge. ZoraNeale Hurston, an American Folklorist once described research as formalized curiosity and that it is about poking and prying with a purpose. Research in Learning institutions can be categorized using the following considerations; Forms of Research, Methods of Research and Design of Research.

Relevance of ICT in Research in Learning Institutions

ICT is a significant component of research in Learning institutions, mainly to support research initiatives and also to expand research dimensions within ICT itself. According to Luckson et al [13], ICT as domain of knowledge, media and resource tools for communication potentially fulcrums functional networks among academics within Learning institutions. Their findings scored the relevance of knowledge dissemination as a meaningful component of research hence appreciating the significant connections between research, publications and library in Learning institutions. Research in ICT is both multimodal and multidisciplinary process as it hinges different research fields. Dirk Schneckenberg [14] in his research paper views ICT potential as the centre piece to eCompetence Development Process, an innovative angle to post-industrial Europe and places universities as key actors towards its realizations. In Balasubramanian et al [15] paper, four important contributions of ICT in research for Learning institutions are identified

as; Increase Bandwidth and Computing Power, Communication Links, Combination of Communication Links and Libraries and ICT Policies in Learning institutions.

ICT therefore plays significant role in enhancing research activities since it is an activator of knowledge management [16] in Learning institutions. Knowledge management encompasses knowledge growth, knowledge communication and knowledge preservation. Research is a structural process phasing through significant steps towards solutions, and ICT integration through research layers can be as in table below.

Research Layers	Descriptions& Expectations	ICT Integration	Effects/Impacts
Observations and Descriptions	To observe and ask	Data Capture tools & techniques	Economy on Time & Distance
Predictions	Take Statement of Intent, developing strong hypothesis	Prediction Models (Algorithms, Tools)	Predictive, Cognitive & Proactive
Determination of Causes	Statistical procedures to disapprove hypotheses	Analysis Tools, Simulators	Improvement on Quality
Explanation	Possible explanations of happenings	Computational Models, Theories	Authentication of Conclusions
New Directions	Validity of results, new research areas	Data Validation Tools, Testing Models	Quality Assurance

Table 1 Showing ICT Integration in Research Layers and their Impacts

Publications: Knowledge Broadcasting in Learning institutions

Publication in the legal perspective is attached to distribution of copies with express consent of the author. In the context of Learning institutions, it leans towards scholarly publications [17] as opposed to commercial publications due model in applications. In scholarly publications e.g. as in scientific journals, the authors unlike their counterparts in commercial publications do not necessarily depend on revenues generated from their work but are more motivated by desire to share discovered knowledge to academic communities.

Role of ICT in Publication in Learning institutions

Use of ICT in publications can be viewed in two ways; using ICT tools in completing the productions process, and also using ICT infrastructure and systems to avail published materials for consumptions.

These can be summarized as below;

- (i) Publication being a step by step process, ICT integration in every step of production can be summarized in the table below. The summary is retrieved from [19] [20].

Process	Descriptions	ICT Integration	Effects / Impacts
Idea	Topic (raw)	-	-
Research	Information gathering	Online libraries, digital archives, ICT	Access time reduced
Informal	Communication with no	ICT	Saves time over

Communication	structural agenda	communication systems	distance
Idea Protection	Patents, copyrights, trademarks, etc	ICT Equipment and Applications e.g.	Improved Security, Privacy Protection
Report findings	Lab Reports	ICT Systems, Applications	Accuracy, Quality
Productions	Books, Journals, Online (Blogs, Forums, E-books, Websites, Tutorials	Contents productions and Online publications	Saves Distance, Costs, and Expands Access Population

Table 2 showing ICT Integration in Publication Process and Corresponding Impacts

- (ii) Use of ICT Infrastructure and Systems in Publications: As much as it might be interpreted as more to do with electronic publishing [22] [23] in some literature, more focus here is about use of ICT infrastructure and systems to support publications with bias towards publications relevant to Learning institutions.

Publishing Models	ICT Integration and Impacts
E-Books	Quick publishing and dissemination of information. Use SGML software for production. Saves time and cost on production.
E-Periodicals	Includes e-journals, newsletters, magazines and discussions lists.
E-Databases	Academic library database online e.g. OPAC and allows universal access through digital networks
E-Publishing on CD-ROMs	Research materials stored on movable media to allow capacity and convenience access for offline audience.
Print-On-Demand	Mix of Electronic and Print Publishing where hard copies are obtained on order. Flexible as it strike balance among consumers.
Digital Content	Delivered to consumers through downloads to handheld and other wireless devices. Always in Adobe PDF, XML, WAP etc
Electronic Ink	Used in creating publications that updates themselves e.g. evident on billboards that changes contents by itself
Email Publishing	Delivery of regular content-based email messages e.g. for newsletters, online journals, mailing lists and discussion lists. Ease in delivery and production, saves on time, distance and consumers.
Web Publishing	With introduction of new development languages like XML, publishers are able to make contents that are viewable on portable devices.

Table 3 showing Publishing Models, ICT Integration and Associated Impacts

Library: Knowledge Reservoir in Learning institutions

Library holds definitive position depending on its application e.g. in computing or operating systems for that matter, the term library or libraries refer to a folder or folders with sub-folders inside. By design, this enables users to control contents (document library) folder structure stored in a system. On the same note, a library is reference term appended to a building or room that is used to keep collection of books, periodicals, films, music etc for people to access, lend and use. In the context of Learning institutions, a library is collection of researched academic publications organized in a retrieval structure for readership population. The most applicable type of library in Learning institutions context is academic one.

Role of ICT in Libraries in Learning institutions

ICT infrastructure and mountable technologies like the Internet have revolutionary effect on the functional life of libraries because it spans beyond the fundamental organization and activation of retrieval criteria. Table 4 below summarizes impacts of ICT on different types of libraries in use.

Library Types	Descriptions	ICT Integration / Impacts
National	National repository of information with right of legal deposits	Improvement of security through configured access functions
Research	Contains in-depth collections of material in one or more subject area	Superior storage and retrieval functions for concurrent access
Reference	Contain materials that are not lent but for on-site reading purposes	Authorization, Access Facilities and Authentication systems
Public Lending	Serves the public and borrowing section is activated; non-restrictive	Managed consumers' database and controlled access functionality
Academic	Provide resources and research support to academic community	Available, Scalable, Portable and Secure services
Children's	Special collections of materials intended for juvenile readers	User interface (graphical, interactive) appreciated by juvenile readers
Special	Contains specialized research materials for employees e.g. hospitals, museums etc	Improved access infrastructure with in-built secure retrieval functionalities

Table 4 showing different types of libraries and Impact of ICT integration

Libraries have been considered as the storehouses of books but with the intervention of ICT, their organization, administration and other technical processing have become easier and more quantum of work are done in a more relaxed mood [4]. While general ICT application tools and Integrated Library Management Systems are largely used in housekeeping operations, like acquisition, cataloguing, circulation control, serials control etc; the Internet has been used extensively as a resource as well as a tool to deliver the Library and Information Services (LIS) [1]. Digital library services have evolved after the implementation of ICT in the library and information centers. ICT enabled services can be viewed in two ways; either ICT enabled conventional LIS that can be delivered more efficiently through use of ICT infrastructure, systems and applications, or New Services, which have been made possible due to developments in ICT [8]. ICT Enabled Conventional LIS can further be divided into Online Public Access Catalogue and User Services that handles organization of contents, and Information Services that handles service formats.

ICT in research, publications and library in learning institutions
ICT as a Connector between Research, Publications and Library as applies in Learning institutions

From literary sources and analysis, our study concluded that ICT has visible role in activating relevance of Research, Publications and Library in Learning institutions. i.e. it has relationship to improve on the foci areas of our research. Below is a figure demonstrating the connector role of ICT in the three areas i.e. Research, Publications and Library.

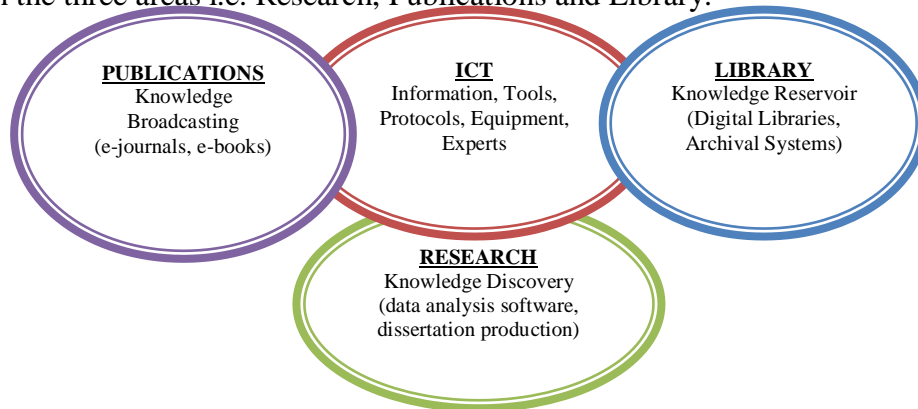


Fig 1 Showing ICT as a Driver to Research, Publications and Library in Learning institutions
 From Fig 1 above, it graphically demonstrate that ICT has relationship with the three research foci; Research, Publications and Library through involving its tools and technology

The Tripartite Inter-dependence Relationship between Research, Publications and Library as applies in Learning institutions Environment

It is evident that Research, Publications and Library have connection with ICT as it integrates in one or the other. Below is a diagram that demonstrates that among the three research foci; they have inter-dependence relationship.

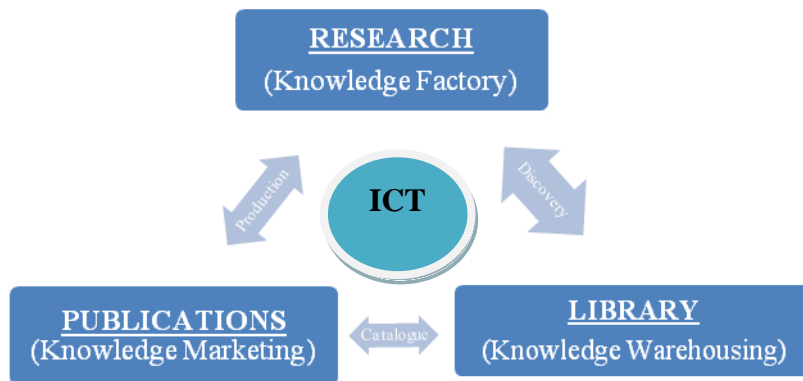


Fig 2 showing the Inter-Dependence between Research, Publications and Library as Underpinned by ICT as applies in Learning institutions

From the Fig 2, Research is supported by Library through available literature for understanding of researched area. Research supports Library by discovering knowledge that is stocked for

consumers. Publications help in producing Research work that is merchandised in for use. Research supports Publications by supplying publishable contents for publications. Publications are supported by Library as it stores already published materials ready for consumptions. Library does this by cataloguing Publications for ease of access and availability for contents consumers. ICT is visible in all these as through its infrastructure, researchers access Library contents faster thence saves on time and distance related costs, through access functionalities and communication medium, publishable contents are available for consumers, and ICT tools are used in Research and faster publishing e.g. online publishing.

Impacts of ICT on Research, Publications and Library in Learning institutions

Table below summarizes ICT Impacts on Research, Publications and Library as applies to Learning institutions.

Focal Area	Positive Impacts	Negative Impacts
Research	<ul style="list-style-type: none"> - ICT tools for data gathering, observations and analysis - Enhancing collaborative research initiatives through reliable communication links - Advanced data analysis tools - Powerful computing systems that interpret complex research situations - Systems used in data collection in risk points - Online data repository for literature review - Proliferations of cheap portable and wireless hardware ease access burden - Facilitation of multi-disciplinary research initiatives by use of ICT 	<ul style="list-style-type: none"> - Privacy violations as some tools - High bandwidth costs - Associated health hazards with over exposure to such systems - Plagiarism and copyright abuse - Malicious programs glittering as downloadable materials may dismember local PC
Publications	<ul style="list-style-type: none"> - ICT infrastructure and tools for instant publications - Faster production of research materials - Consumable format - Idea protection through digital formulation - Availability of publications at all time - Translation tools allows production in many languages faster 	<ul style="list-style-type: none"> - Reading digital publications for long may cause health complications - Loss of revenues for commercial publications cost of reproduction is relatively affordable
Library	<ul style="list-style-type: none"> - Time independent access to library services - Availability of library facilities to physically impaired - Portable and massive contents storage - Configured functionalities allow a single material to be accessed concurrently - Easy content posting and modifications 	<ul style="list-style-type: none"> - Unwarranted downtime transfer costs to access - Online frauds may compromise copyrights - Malicious programs may re-configure retrieval parameters

Table 5 showing Summary of ICT Impacts on Research, Publications and Library in Learning institutions

Framework for ICT Impacts on Research, Publications and Library in Learning institutions

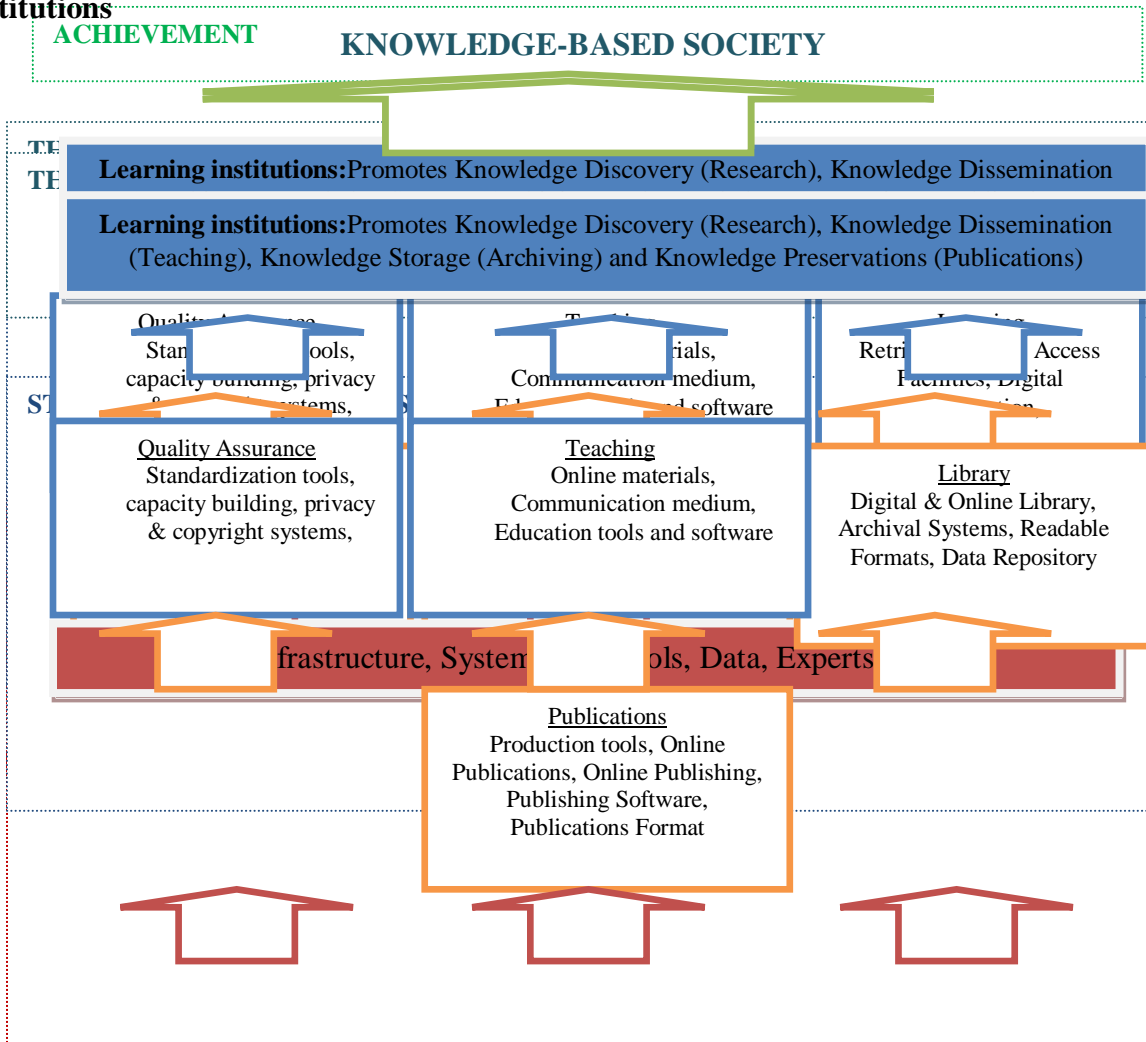


Fig 3 showing Proposed Conceptual Framework for ICT Impacts on Research, Publications and Library in Learning institutions as Underpinned by Information and Communication Technology (ICT)

Conclusions and future work

Evidently, ICT has revolutionized Learning institutions as it has visibly improved the principal pillars as demonstrated by the studied trio foci areas; Research, Publications and Library.

Our study managed to make achievements in satisfying its objectives in;

Reviewing existing literature and related work that has been done by fellow researchers to bring understanding of intended research study

Identifying and discussing respective impacts of ICT in Research, Publications and Library in Learning institutions

Co-relating Research, Publications and Library as underpinned by ICT as applies to Learning institutions

Establishing connection existing between Research, Publications and Library as underpinned by ICT in Learning institutions

Proposed Framework for ICT Impacts on Research, Publications and Library in Learning institutions

We identified this research area as ripe and proposed need for further work in order to cover a comprehensive research spectrum. The following are potential focal areas that shall improve the quality of ICT Impacts in Learning institutions;

- (i) Employing Empirical Research Approach: Evidential data shall be more expressive and convincingly improves the quality of research findings especially after subjecting them to quality analysis.
- (ii) Integrating Measurable ICT Indicators in Exploring Research, Publications and Library in Learning institutions: ICT Impact Indicators that are testable supply required research ingredients and expands the conclusion base when it comes to understanding ICT impacts in Learning institutions as studied under the three foci areas.
- (iii) Investigating of ICT Impacts on Research, Publications and Library in Non-Academic Research Institutions: Research findings from non-academic research institutions in regards to analyzing ICT roles offer wider conceptual understanding and enable more acceptable conclusions when relating contributions in the three research foci.
- (iv) Effects of ICT impacts on Research, Publications and Library in Quality Assurance in Learning institutions: There is need also to relate similar research with contributions towards quality assurance as a principal pillar of Learning institutions. This shall also incorporate study on impacts as felt on Teaching, Learning and Assessment in Learning institutions.

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A GIS-Based Parking Management and Dissemination System

By

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Abstract

Parking is dynamic. One minute a parking space is engaged and the next ten or so minutes its vacant. Finding a parking space has thus become a nightmare in many cities. There are many Parking Guidance Information Systems, PGIS meant to alleviate a driver's pain of finding or reserving a parking space but they operate as standalone systems and therefore disseminate information only to a selected few at a given time. The aim of this study is to have a Geographic Information System, GIS that will enhance the components of a PGIS so that it runs on a mobile phone platform thereby allowing a driver to access parking information whenever and wherever he is. The GIS-based PGIS will provide the driver with a view of the near real time parking situation of his destination, allow him to reserve a space as well as have his smart phone enabled to notify him once he approaches a vacant space or even perform routing functions. Thirty parking spaces were collected within Jomo Kenyatta University of Agriculture and Technology, J.K.U.A.T classified, mapped and published in a web map server. A Quick Response Code, QR was installed on each parking space and a SMS server established to monitor the reports and requests of drivers. An Android smart phone application was created that was able to reap parking information from the map server. The system greatly reduced the trial and error involved while in search of a parking space thus increasing a driver's confidence, cutting down on the amount of parking time and the emotional stress associated with finding a parking space.

Keywords; Android, Parking, PGIS, QR Codes, Geographic Information System

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Introduction

THE number of automobiles in many nations is becoming larger and larger and it's increasingly difficult to park. The Global Parking Survey, 2011, conducted by the International Business Machines, IBM showed that drivers in 20 international cities face a daily struggle in finding a parking space. Six out of 10 drivers abandoned their search for a space at least once. The report also revealed that over 30 percent of traffic in a city is caused by drivers searching for a parking spot. Over half of all drivers in 16 of the 20 cities surveyed reported that they have been frustrated enough that they gave up looking for a parking space and simply drove somewhere else. Parking is dynamic; an aspect which many traditional Parking Guidance Information Systems, PGIS are failing to address [1]. Figure 1 shows a typical PGIS display that only serves a selected few road users at a given time. A good solution for the pressing parking problem would be to increase the number of parking spaces and enlarge parking lots but this will involve gigantic investments [2]. However better management of the existing parking facilities is seen as a wise stop gap measure. Many drivers find themselves making guess work while looking for parking space simply because they are not aware of the parking situation in their immediate environment. To disseminate parking information which is ever changing, one would require a fast medium of communication like the internet. The internet has revolutionized the world of communication [3] and many people are using the internet as their main source of information. Moreover, the internet has already been incorporated into developed nations' societies and is quickly penetrating developing ones too [4]. The widespread internet access since the 1990's have not only thinned the line separating office and home, but substantially contributed to the increasing mobility of our working and everyday life [5]. This is especially so with the advent of smart phones which virtually enables the user to 'carry' the internet with him wherever he goes. The increased use of handheld mobile devices including Personal Data Assistant and mobile phones has been likened to "Putting yourself in the world and world in your palm" [5]. A map which was only viewable on desktop computer can now be seen in many screens connected to the over the World Wide Web including smartphones. Currently there is a proliferation of virtual maps including Google Maps, Bing Maps, ESRI Maps and Apple Maps. With these maps many have been able to find places, directions, geotag their pictures get distances, etc. in their phones.



Fig. 1 A typical Parking Guidance Information System

Mobile maps and devices

Maps in the pre-internet times can be grouped into three categories: view only maps, analytical maps and explorative maps. Though maps still remain the most popular communication language of spatial information the internet and advances in technology has necessitated a creation new kind of maps that will serve the same use as the old maps as well as incorporate dynamism and mobility. Modern maps are no longer used for mere presentation but for interactive and individual exploration of temporal and non-temporal spatial data. The internet has revolutionized the distribution of screen maps with the web-based maps being seen as a metaphor to spatialise the information space and as a collaborative thinking instrument shared by spatially separated users. The realization of wireless internet access has brought web maps back to

mobile environments where they are most needed. Figure 2 illustrates the operations of a mobile GIS platform.

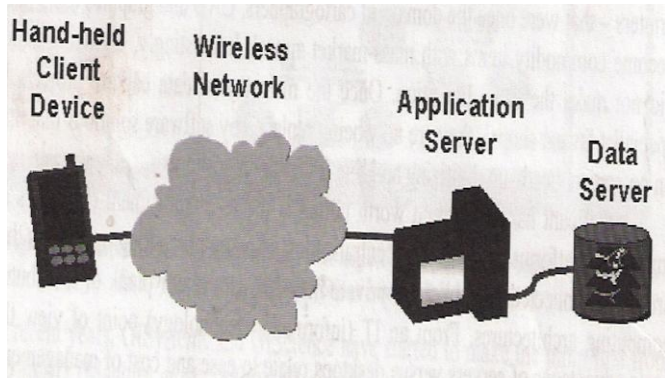


Fig. 2 Hand held mobile GIS platform

Unlike web-maps, mobile maps are more personal and provide better platform to relay spatial information especially of a temporal nature. A mobile map is somewhat like a snapshot of an environment around a certain location and time, but with highly selective information and integrated intelligence. Most of our daily activities require us to be in motion and driving is no exception. With parking spaces being engaged on and off, a static or a standalone system, like the case of most PGIS would seem handicapped in relaying parking information. Mobility is unquestionably a fundamental aspect of contemporary life. With mobile maps modern mobile people (drivers) will be better informed of the events from near and far, past, present and future; ensuring they are better prepared for their tasks. There is a wide array of hand-held devices that can be classified into three types based on weight, power, cost and functional capabilities. These are Portable PCs, PDAs and mobile phones. This study focuses on the mobile phone since currently it's the most used type, versatile and most applicable for disseminating parking information to many users at a time. Moreover, a key feature of mobile phones is that they have the ability to determine their location using Global Positioning Systems, GPS embedded in them. Other characteristics that make mobile phones better suited for mobile GIS include; high mobility, dynamism and ability to operate in real time, supports applications and ability to sense locational information. It's because of the above reasons that such mobile phones have been branded a new name: Smart phones. Smart phones have hit the market with huge sales. Unlike standard cell phones they have additional features that allow the user to do a lot of things on and off the internet. An operating system like Android enables one to log in the internet and install applications suited for his needs. For instance, Quick Response (QR) Codes and Quick Response Readers are features that are gaining popularity across the nations. A smart phone equipped with a QR Reader application is able to decode information encrypted in QR Code and prompt the phone to do necessary action as directed by the QR Code. Figure 3 shows how a smart phone scans a QR Code.



Fig. 3 A QR Code and a smart phone with QR Reader

There are codes that prompt the phone to make a call to a specific number, open the default browser of the phone and visit a particular website, display a message or even prompt the user to send a message to a particular number upon populating the Short Message Service, SMS function of the phone. The SMS-QR Code type is used in this study. The idea is to automate the message sending function of the phone thus reduce time and effort in relaying a SMS.

Parking guidance and information system

Parking Guidance Information System (PGIS) is also known as Advanced Parking Information System (APIS) It is to promote the effective utilization of parking lot and adjacent roads, to provide parking location, condition, road traffic routes and other information related by variety ways to induce the driver to find the parking most effectively. The objectives of the system can be summarized into the followings [6].

The angle of road use: helping drivers find parking as soon as possible to shorten the parade time, depress invalid traffic of finding parking, improve road usage. To a certain extent, the pressure of Guidance area traffic can be eased. Thereby, the situation of urban traffic congestion can be improved. The angle of parking facilities using: reducing the vacancy rate, promoting balanced use of parking, improving parking turnover rate, protecting the economic benefits of car parks and promoting the economic vitality of commercial facilities within the system.

The angle of parking manager: optimizing parking environment, reducing the phenomenon of illegal parking. It requires a high level of car park construction and management for induction system implementation, helping to improve overall function and management level of parking services.

The angle of city management: parking space can be found quickly by real-time parking guidance. Thus, the energy waste, air pollution and noise pollution can be reduced. It is directly convenient for motorists travel to improve the quality of people's life.

Analysis on Function of Parking Guidance Information System

Parking guidance information system plays a very important role in regulating parking demand in time and space, improving the parking facility utilization, reducing the road traffic arising from searching for parking, improving the efficiency of the transportation system, improving operation conditions and increasing economic vitality of business areas and so on. With the purpose of the system, parking guidance information system need to meet the requirements of functions as follows [7].

a) The system should collect real-time information about the status of the car park accurately, and delivery to the management center timely. It should achieve interaction of all car parks within the planning region and management center, that is, to achieve the integration about physical facilities and management center of the existing management systems and parking guidance information system center software of a single point parking lot, and to ensure that the design number of parking can be expanded.

b) The system should imply automated management of car park, including charging systems, computerized management and rapid query, statistics and analysis of data. It also has extension functions that connecting with other intelligent transportation system urban.

c) The management center of the system has strong functions of statistic data and information processing, storage, the integration of parking management information, and the reliability processing of the release data information. It also should include traffic flow reporting system, storage and statistics of parking registration information table, statistics of signs registered information table, and storage and statistics of vehicle information table within the parking.

d) It can use the information released screen to supply the information of parking location and status of parking space for the drivers when they come into the induction area.

e) Parking spaces information should be queried in the information management center of this system, including the using parking information, real-time parking information of LED screen, and daily flow of cars at parking.

Design of Parking Guidance Information System Framework

Logical structure is an auxiliary tool of organizing complex entities and relationships, which focuses on the functionality processing and information flow of the system. The function of each subsystem and the linkages between these subsystems and interaction relationships can be seen through the logical structure of parking guidance information system

System information collection, processing, distribution, transmission in the system should be integrated calculated rationally in the parking guidance information system. Also, the other external conditions outside the system such as driver behavior analysis, network traffic control and management, parking operation should be integrated calculated to strengthen the utility and effectiveness based on correctness of software systems. In the parking guidance information system, the data processing of information is the key to the whole system. System software can predict the change of parking utilization through data processing, comprehensive analysis of the basis of data collected and the static data set before, state of road network, and parking facilities.

Analysis on System Function Module

A direct function of parking guidance information system is to provide parking information for parking demander and traffic manager. Analyzed from Information transmission process of parking, parking guidance information system should have four functional modules, which are information collection, information processing, information transmission, and information dissemination. The release of stopping information can be achieved from interdependence and interaction of the four function modules [8].

a) Information collection module

Information collection module can capture real-time information on parking usage accurately and transmit to the management center timely. Via remote monitoring devices and sensing devices, parking information can be collected. The parking traffic information can also be obtained through traffic information collection system.

b) Information processing module

Information processing module is responsible for processing information such as surrounding road information and the state of parking using into appropriate form that can be provided for driver. The information such as parking spaces, remaining car places, congestion condition of distribution road and so on can be processed. The module also can store parking information, predict available parking, and process the changes of parking patterns. These features are basis for future services such as the forecast of the parking demand conditions, parking information inquiry, parking scheduled. Information processing is mainly made by management center hardware and system software.

c) Information transmission module

The basic task of information transmission module is to ensure that the flow that from the information collecting system to the information processing system and then to the information release system is smooth. Then, the data can be exchanged within the client of collection, management and distribution center.

d) Information dissemination module

The task of information dissemination is to release information processed by information processed

systems to the outside in an appropriate manner. Information dissemination system includes a variety of publishing tools, such as the LED screen, traffic information broadcasting and television, Internet and other networks and phone inquiries, considering using geographic information system and car navigation system release information in future. Released information includes parking position, parking number or occupancy and the distribution of parking facilities in surrounding.

Methodology

Jomo Kenyatta University of Agriculture and Technology is one of the public universities in Kenya. Its mainstay is Agriculture and Technology. It's located in Juja Town which is about 50 Km from Nairobi. The institution has a geographical extent of 9,878,000-9,880,000 south and 278,000- 280,000 east, UTM Arc1960. Figure 4 shows the extent of the study area.

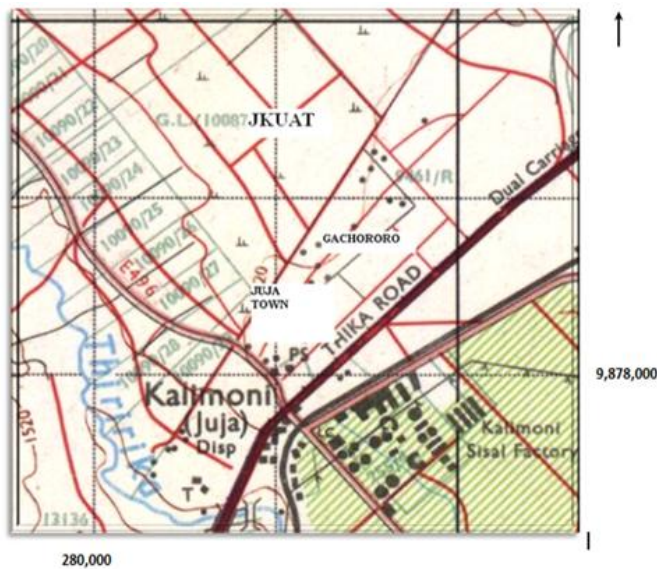


Fig. 4 An extract of a topographical map showing J.K.U.A.T

It harbors a student population of approximately 5000 with quite a large number of teaching and non-teaching staff some of whom use the parking facilities daily. According to the recent survey conducted by institution's Estates department, the university records the highest number of cars every Monday and Friday with a total of number of not less than a thousand cars. The average number of cars for the others days of the week is six hundred. With only a few numbers of parking lots, some drivers are forced to park in undesignated areas like gardens and under tree shades. The situation gets worse during graduation events.

Figure 5 shows how the system is assembled which starts with mapping of parking spaces in the study area. Each parking space is uniquely identified with a special number and QR code generated for each space. The code also includes the dispatcher's mobile number. A database showing all the mapped parking spaces with their attributes is created. A SMS server is established that forms a link between the parking spaces and the geodatabase. A web server Application Programming Interface, API is established and published over the internet which can be accessed and analyzed by an Android smart phone application.

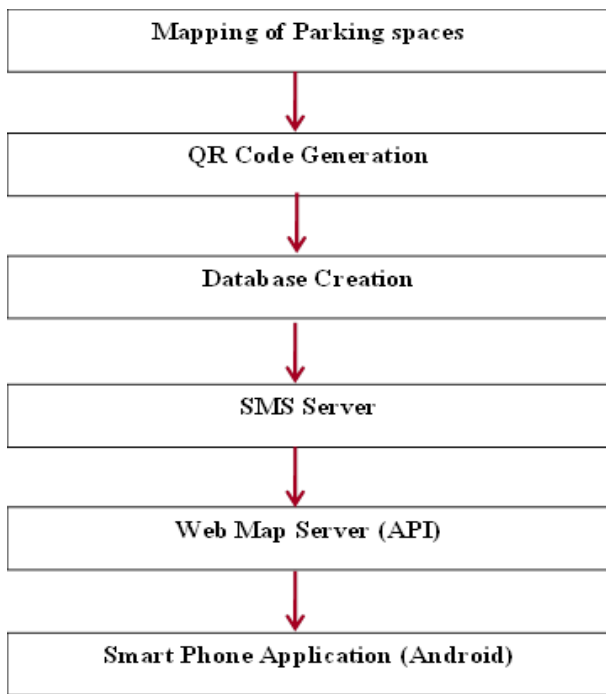


Fig. 5 System flow chart

The system offers several options through which the user, a driver, can use to access and report parking information. It has three basic components viz, the driver's smart phone, internet and QR codes that are connected via a spatial database or geodatabase. The smart phone allows the driver to request, book for a parking space, report his occupancy at a given as well as receive confirmations of any transactions. These are enabled by the SMS function of the smart phone. In addition to these, one can use the smart phone to have a bird's eye view of the parking areas and also use the phone as a guidance tool. The internet is used as the communication medium that links the activities on parking lots, the geodatabase and the driver's smart phones.

Parking spaces are spatial objects with different coordinates and attributes. Jomo Kenyatta University has several park lots to cater for the ever growing number of cars. These parking spaces are normally named after the building they are installed at and have different properties. . Some spaces are dedicated to drivers with disabilities and some for long vehicles. Considering that the system will finally run on Android smart phone, a special data application was created that was able to use a smart phone's GPS, pick the parking spaces and send the coordinates plus attributes to an online database via the phone's default pocket data function, see Figure 6.



Fig. 6 mapping parking data using a smart phone application

Attributes for the parking spaces were the type of parking, whether Normal, Long/High or Disabled, the region and location of the parking lot. Once the data was entered on the field and sent over the internet, the online database was automatically populated. A SMS type of QR code was generated using the Quantum QR generator. A QR code for each parking space is generated where the unique identification number is encoded. The dispatcher's cell phone is also included in each QR code. Therefore on each parking a QR code having the parking space number and the dispatcher's mobile number is installed. All the parking spaces in the study area are installed outdoors. Thus the QR affixed on the parking space will be exposed to different weather conditions including scorching sun, rain and dust. The QR was thus printed on metallic plate since metal will endure these weather conditions. This is as shown in Figure 7. Moreover there is surety that the QR print will not erase easily on the metallic plate. Most parking spaces have already round metal bars marking the end of the space. Screwing a QR code on a metallic plate was also easy and a permanent way of placing the QR code. This QR will prepopulate a driver's SMS function of his phone with the parking space unique number and prompt him to put his cars registration and then send the message to control room. Figure 8 shows how the QR Code was installed in a parking lot.

Diafaan SMS server was used to form a link between the drivers' messages and the geodatabase. The server receives requests, reports and bookings from the drivers, replies automatically to respective drivers and filters the messages to get the unique numbers which will be used to update the database and consequently the web map.

An extent defining the study area was defined in Google Maps and customization of the web page done. The mapped parking spaces were published to the internet and appeared on this extent having their unique attributes i.e. Normal, Disabled and Long/High. A facility for booking was also installed that will allow one to zoom in a specific parking space and leave his personal details. The web page has both the list of all the parking lots and a web map which displays the same. If a parking space is vacant then it is visible on the web map but if its booked or occupied, then it will disappear from the screen until it's declared vacant again.



Fig. 7 A QR Code affixed to a parking barrier



Fig. 8 A car parked by a parking barrier with a QR Code

Using Java programming for Android, a customized application was assembled that is installable in an Android based smart phone. The application connects with the GPS and pocket data functions of the phone. There is a welcoming page that directs the user to a short menu. Here one is given the option to have a view of the available parking spaces displayed as a list or alternatively launch the phone's browser hence display scaled version of the web map. A booking facility is also put in place that allows the driver to send his car's registration number. A SMS will be sent to the driver confirming his request and alerting him that his booking will elapse after a span of half an hour. By identifying his desired parking space and connecting to the GPS, the application, there is an option of performing routing function where the parking space and driver's position are treated as the destination and starting points respectively. A line is drawn on the smart phone web map to be used as a guide to the driver.

results

Web Interface Visual Display and Parking Reservation

A web map page for Jomo Kenyatta University was created showing vacant parking spaces as shown in Figure 9.



Fig. 9 Web map page for J.K.U.AT

This web interface operates on a near-real time mode since it will automatically update itself and reflect the situation on the park lots. The interface is connected to SMS server hence every request, booking or report will be recorded and reflected on the web map. The web map is also tied to the Android web application in such a way that whatever happens on it is published to the smart phone application via internet. The web page allows one to have a near-real time visual look of the parking situation within the university. This is a crucial element since one will make a better decision about his desired parking. On the web page there is a list of the available parking spaces which one can upon click on one, make a booking. There's also a map showing the parking spaces listed on the left. A legend showing the types of parking spaces is also included. Here one can flip through the various base maps to suit his interests. For instance one can switch to satellite view to have a look of the parking space against the satellite view of the institution as shown in Figure 10.

The web interface provides a facility to make bookings of the desired parking space. Here a driver accessing the web page identifies a parking space of his choice clicks on it and enters his personal details in the pop up window. Figure 11 shows the booking facility of the web map. A message of confirmation is send back to the driver telling him the particular spot has been reserved and will expire after 30 minutes. Another message is also send to the parking attendant alerting him of the booking.

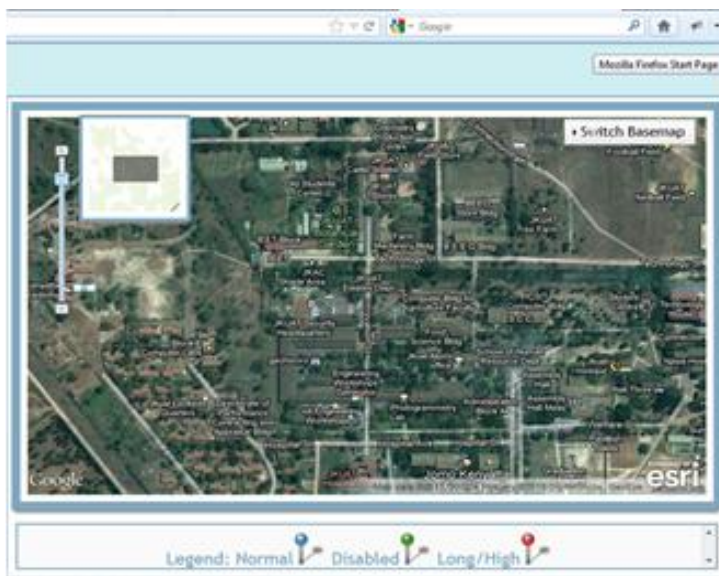


Fig. 10 The web map with satellite view as the base map

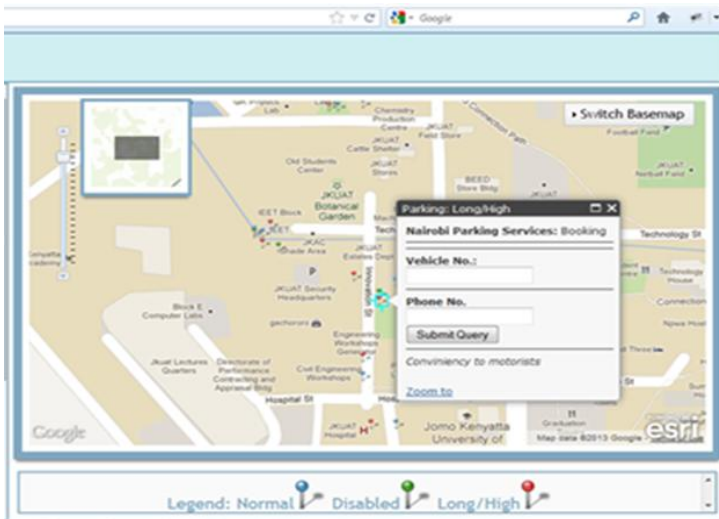


Fig. 11 The booking facility of the web map

Smart phone Application

The web interface was scaled down to a format installable in an Android smart phone. The application was published in the Google Store market where one can download and install for free. A shortcut icon appears in the main menu of the phone which once clicked leads one to the sub menu of the application. Figure 12 shows a smart phone having the application shortcut marked with a letter 'P'. The display of the available parking spaces was done using two ways; by listing available parking or an online map.

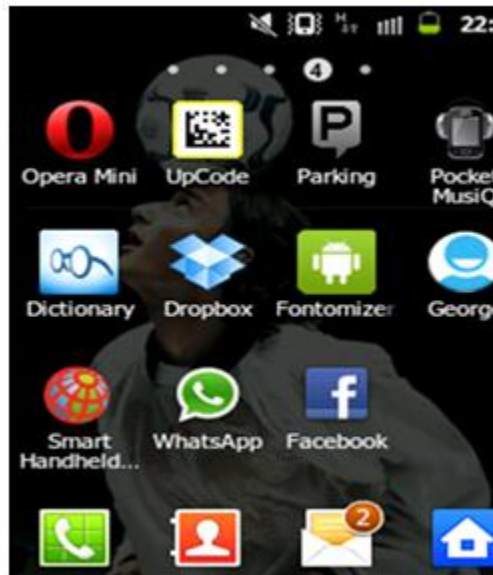


Fig. 12 Menu of a smart phone showing the smart phone application short cut icon marked with the letter 'P'

Figure 13 show the welcoming page that comes on when one initiates the smart phone application



Fig. 13 The welcoming page of the smart phone application

The map and list options are as shown by figure 14. The list option leads one to a list of the available parking spaces which one can choose from as shown in Figure 15. Figure 16 shows a booking facility for reserving a particular space in the Android application. A pop window appears when one selects a parking space prompting him to enter his personal details. A confirmation message is reverted back to the driver and the particular lot removed both from the list and on the map.

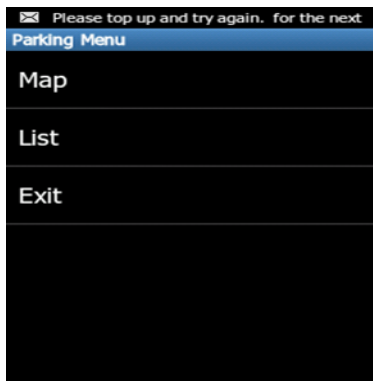


Fig. 14 The Map and List options of the smart phone application



Fig. 15 List of vacant parking spaces

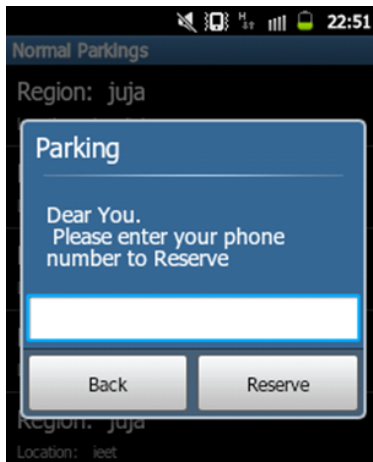


Fig. 16 The booking facility of the smart phone application

The map option displays the available parking spaces. This is as shown in Figure 17 It allows one to hover around the study area by touch of button or swipe of the screen.

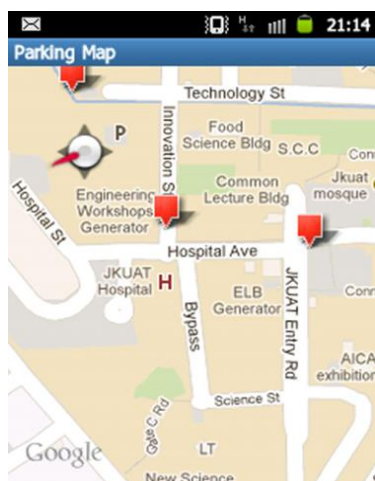


Fig. 17 The Map option of the smart phone application

The properties of a particular parking space are displayed once it's clicked as shown in Figure 18



Fig. 18 The smart phone Map showing a parking space in the workshop area of the university.

Conclusion

GIS was seen as a good tool to better the services of a parking guidance information system especially if it's a mobile GIS. Traditional methods of relaying parking information which included road signs and off road visual displays were rather limited in that only a portion of road users could access the information at a time. A PGIS powered with a mobile GIS can deliver such information to as many road users one can think of at a time despite their location. Additional advantages of the system over traditional PGIS dissemination methods include;

a) Traditional PGIS dissemination methods only showed the status of a parking lot i.e. the number of occupied and vacant parking spaces. This mobile GIS PGIS allows the driver not only to know the number of vacant spaces but also other information e.g. road names for foreigners, booking facility and other important details derived from the base maps.

b) The system can further provide vital information like indicating driving directions for the driver. This is made possible since the system is connected to the GPS facility of the smart phone.

Having a system that gives a visual display of the current parking situation eliminates the puzzle a driver finds himself in while looking for a parking space. It enhances his decision making ability while he is still on the move thus cuts down the amount of time spent in finding a parking spot, reduces traffic snarl ups and ultimately lowers fuel consumption. Such a display shows the driver a vacant parking closest to at an instance hence reducing driving time drastically. With such capabilities it can be said that a smart phone can be used as a park finder.

Future recommendations on the system are;

a) **Notifications:** Due to the fact the use of cell phones while driving is a crime in most nations, it is recommended the smart phone application be expanded to allow the driver be notified once he is within several meters away from a vacant parking space. The notification may be inform of a loud beep or vibration of the phone. Thus it won't be necessary for the driver to interact with the phone.

b) **Billing:** Parking fees is a source of revenue for most municipalities. Having 100 percent collection of parking fee near impossible. But with such an automation of the parking system and elimination of the

parking attendant as the municipal's trustee to collect the fees can go a long way in maximizing fee collection. The system also can be enhanced by connecting it to the various mobile money transfer services.

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A Framework for Adoption of Wireless Sensor Networks in Weather Forecasting In Kenya

By

Daisy Mbuu Ileri*, Felix Musau & Nicodemus Aketch Ishmael**

Abstract

Wireless Sensor Networks has been prospected as powerful solutions for many applications, such as surveillance, tracking, locating, weather forecasting etc. Weather forecasting is to predict the state of the atmosphere at some future time and the weather conditions that may be expected. Weather forecasting is the single most important practical reason for the existence of meteorology as a science. It is obvious that knowing the future of the weather can be important for individuals and organizations. Accurate weather forecasts can tell a farmer the best time to plant, an airport control tower what information to send to planes that are landing and taking off, and residents of a coastal region when a hurricane might strike among others. In this paper we will examine various challenges of the current weather practice in Kenya, benefits for Wireless Sensor Networks, determine factors influencing the adoption of WSNs in weather forecasting practices by KMD and develop a framework for adoption of WSNs because the current weather forecasting practices in Kenya are not satisfactory.

Keywords; Adoption, Weather forecasting, Wireless Sensor Networks (WSNs)

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Introduction

The word 'adoption' and 'acceptance' are normally used interchangeably. If an idea grows in popularity in the same place it originated, that process is called adoption or acceptance (Barnet,1953).Information technology adoption is defined as the decision to accept or invest in technology (Dasgupta,et al, 2002).

WSNs refer to network consisting of spatially distributed autonomous devices using sensors to cooperatively monitor physical or environmental conditions e.g. temperatures, sound vibration, pressure, motion or Pollutants at different locations. While Wireless is a term used to describe telecommunications in which electromagnetic waves (rather than some form of wire) carry the signal over part or the entire communication path. With the increasing development in microelectronics and wireless networks in the recent few years, the deployment of a large number of small, self-powered and inexpensive devices, in a wide range of daily life applications is becoming more and more feasible. Environmental monitoring, battlefield and harsh areas surveillance, healthcare and agriculture applications are only few examples amongst others (Bulusu et al., 2001; Schwiebert et al., 2001). Commonly, Wireless Sensor Networks (WSNs) are used to monitor the occurring of specific events such as: fire, flooding, air condition change or hazardous material leak. An important issue in such event-based sensor applications is how to report the events as quickly and as efficiently as possible, while taking into consideration the multi-hop fashion the transmission is commonly performed (Sohrabi et al., 2000; Min et al., 2010).

Weather forecasting is to predict the state of the atmosphere at some future time and the weather conditions that may be expected. Weather forecasting is the single most important practical reason for the existence of meteorology as a science. It is obvious that knowing the future of the weather can be important for individuals and organizations. Accurate weather forecasts can tell a farmer the best time to plant, an airport control tower what information to send to planes that are landing and taking off, and residents of a coastal region when a hurricane might strike among others.

Kenya Meteorological Department has provided regular weather forecasts since the 60s. KMD plays a major role because it let the general public know what to expect. Weather forecasts are crucial in our day to day life; the output is used in decision making by decision makers at organizational levels as well as by individuals. Currently the Government of Kenya implements using macro-in fractures based on expensive weather stations of which are sparsely deployed in form of relatively small number of fixed locations to provide climate maps for droughts and other natural disasters prediction.

Overview of Wireless Sensor Networks

Sensor Networks Communication Architecture-The sensor nodes are usually scattered in a sensor field as shown in Fig. 1. Each of these scattered sensor nodes has the capabilities to collect data and route data back to the sink. The sink may communicate with the task manager node via Internet or satellite.

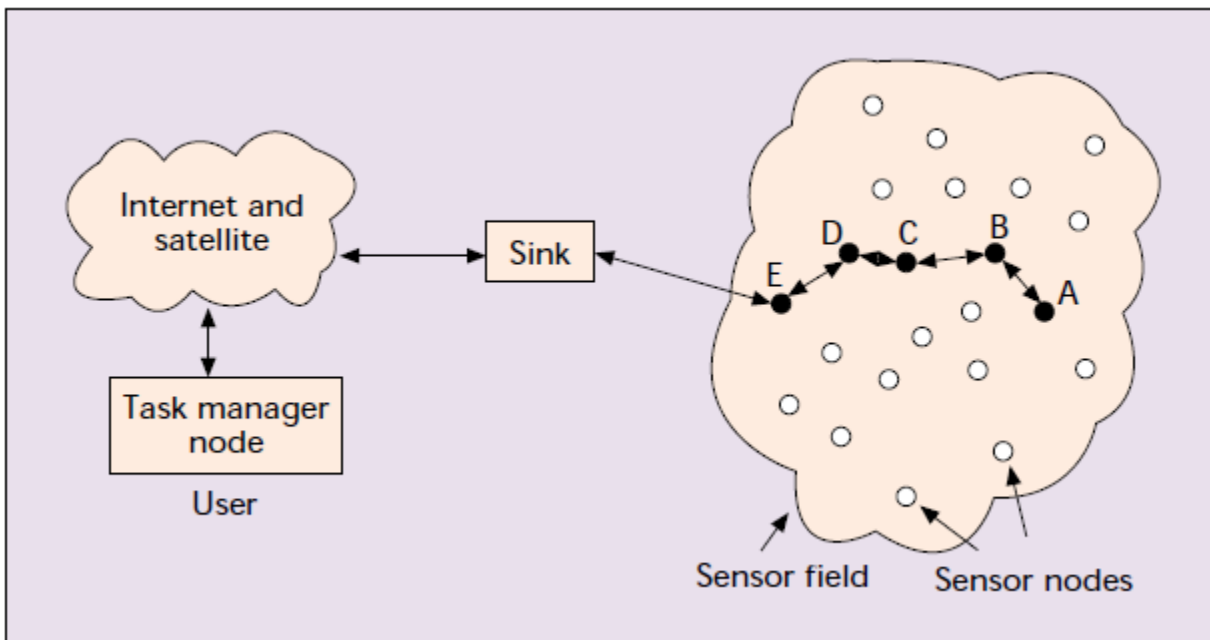


Figure 1 source (Karl and willing, 2005)

Benefits for Wireless Sensor Networks

Al-Sakib and Humayun (2006) noted WSNs benefits; Sensing accuracy: The utilization of a larger number and variety of sensor nodes provides potential for greater accuracy in the information gathered as compared to that obtained from a single sensor. Area coverage: This implies that fast and efficient sensor network could span a greater geographical area without adverse impact on the overall network cost. Minimal human interaction: Having minimum human interaction makes the possibility of having less interruption of the system. Operability in harsh environments: Sensor nodes can be deployed in harsh environments that make the sensor networks more effective. Fault tolerance: Device redundancy and consequently information redundancy can be utilized to ensure a level of fault tolerance in individual sensors. Connectivity: Multiple sensor networks may be connected through sink nodes, along with existing wired networks (e.g. Internet). The clustering of networks enables each individual network to focus on specific areas or events and share only relevant information. Dynamic sensor scheduling: Implying some scheduling scheme, sensor network is capable of setting priority for data transmission.

Sensor Network Applications Areas

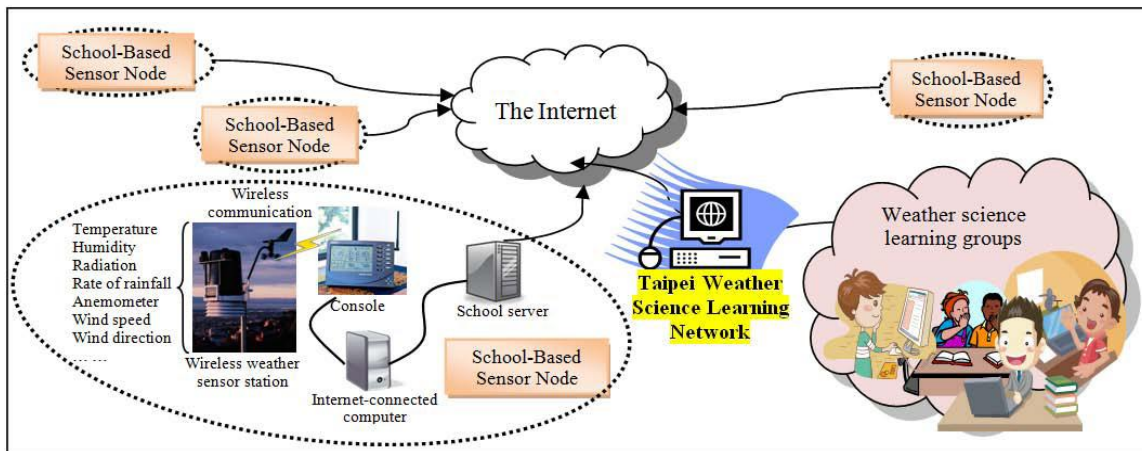
Environmental Applications of Wireless Sensor Networks

Fire Detection in South Korea; According to Son, et al (2006) Forest-Fires Surveillance System (FFSS) was developed to prevent forest fires in the South Korean Mountains and to have an early fire-alarm in real time. The system senses environment state such as temperature, humidity, smoke and determines forest-fires risk-level. Early detection of heat is possible and this allows for the provision of an early alarm in real time when the forest-fire occurs, alerting people to extinguish forest-fires before it grows.

Flood Detection in the US; An ALERT system for flood detection and prevention was deployed in the US , rainfalls, water level and weather sensors were used in that system to detect, predict and hence prevent

floods. The sensors would supply information to a centralized database system in a pre-defined way (Coulson, 2006).

City-Wide Wireless Weather Sensor Network in Taipei ; Chang, et al (2010) developed the project to analyze the effectiveness of a city-wide wireless weather sensor network and Taipei Weather Science Learning Network (TWIN), in facilitating elementary and junior high students’ study of weather science. TWIN provided a distributed wireless weather sensor network throughout Taipei and promoted weather science learning activities for students. The network, composed of sixty school-based weather sensor nodes and a centralized weather data Archive server, the sixty weather sensor nodes were connected by a centralized archive server. The weather data from the area around the weather sensor node were collected every five minutes and wirelessly transferred to the TWIN server. This provided students with current weather data at specific locations in the city. Figure 2.5 shows the distributed architecture of TWIN. Taipei Weather Science Learning Network Architecture



Source: Chang, et. al. (2010)

Figure 2: Taipei Weather Science Learning Network Architecture

The TWIN website is open to the public users who are interested in using the data for Taipei City weather science learning can freely access the database. The website provides not only the current weather status at a particular weather sensor node, but also the past data for all nodes and for elapsed-time periods of five minutes, an hour, a week, or a month.

Health Applications; The small size and light-weight structure of sensor nodes provides much functionality in the health sector including: tracking and monitoring doctors and patients; drug administration and tele-monitoring of human physiological data (Akyildiz et al. 2002).

Commercial Applications; Some of the commercial applications of WSNs include: burglary detection and monitoring; vehicle tracking and detection; interactive museums; environmental control in the buildings; robot control and guidance in automatic manufacturing environments; factory process control and automation; smart structures with sensor nodes embedded inside (Akyildiz et al. 2002)

Military Applications; Dense deployment of low cost disposable sensor nodes makes WSNs concept beneficial for battle fields. Some of the military application areas include; monitoring friendly forces, equipment and ammunition; battlefield surveillance; exploration of opposing forces and terrain; targeting; battle damage assessment and nuclear, biological and chemical attack detection

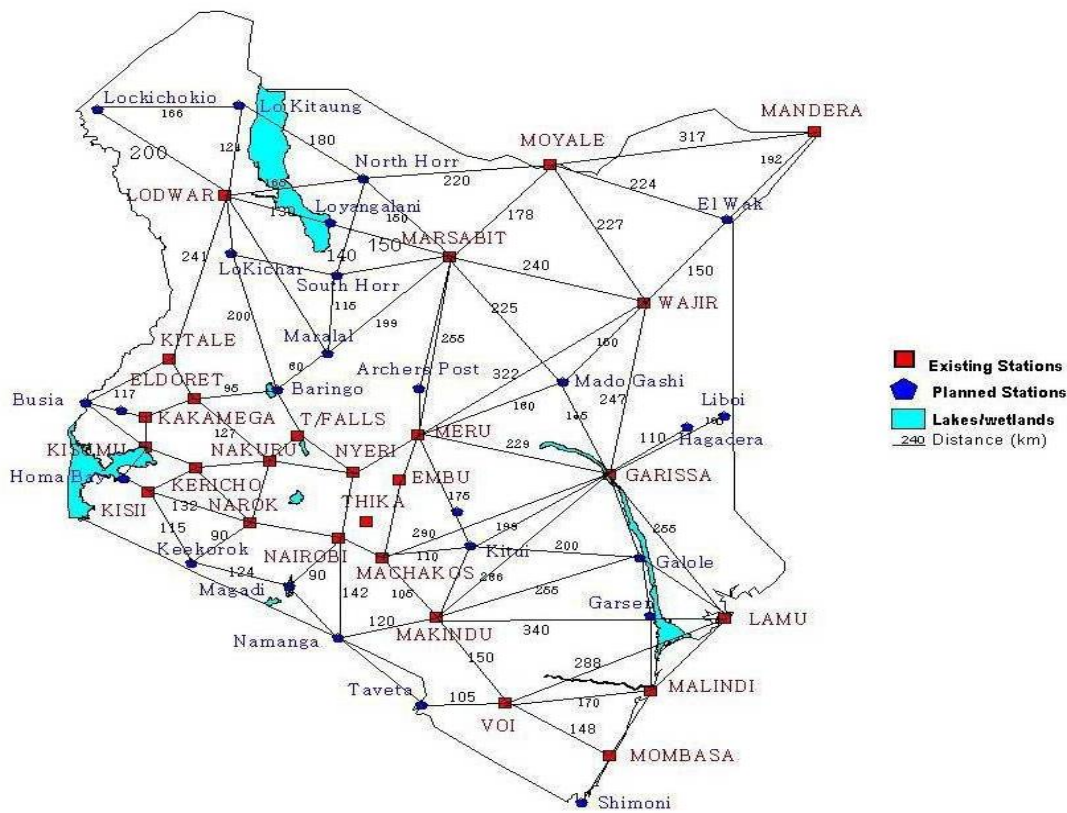
Current Weather Forecasting Practice in Kenya

The monitoring of climatic/weather variations in Kenya is the mandate of the Kenya Meteorological Department. KMD runs 3 main types of stations that are currently managed by the Climatological Section of the Department (<http://www.meteo.go.ke/>): 700 rainfall stations; there were 2,000 of such in 1977; this figure drastically dropped to 1,653 by 1988 and down to 1,497 by 1990; 62 temperature stations; 27 automated weather stations; these are used to observe and record all the surface meteorological data; rainfall, temperature, wind speed and direction, relative humidity, solar radiation, clouds, atmospheric pressure, sun shine hours, evaporation and visibility.

The Agro Meteorological Section on the other hand manages 13 stations related to agriculture; data is remitted from these stations every 10 days. Apart from the normal meteorological observations, other observations by the Agro meteorological Section include: soil temperature, sunshine duration, radiation, pan evaporation and potential evapotranspiration. All this data is stored in semi-automated formats at the Department's Head Quarters in Nairobi. The data is available to interested stakeholders at a fee and on request. The Meteorological Department uses the data collected to provide five main types of forecasts: (<http://www.meteo.go.ke.>)

Challenges That Affect Weather Forecasting In Kenya

Poor Coverage by Weather Stations; Kenya has few weather stations. It is realized that even the few there, are concentrated in Nairobi and other bigger towns leaving majority of remote areas with nothing. This makes it difficult to get the micro-level weather indicators that are necessary for effective forecasts (<http://www.meteo.go.ke.>)



Source, (<http://www.meteo.go.ke>)

Figure 3: The Map of Kenya under Technological Advancements

Cost; the cost of procuring, installing and maintaining of AWS has curtailed the fast process of upgrading the surface observing stations for example. The KMD awarded Sutron cooperation a contract to design, build, and install a Synoptic Met Station at each facility and integrate them into a system at a cost of: \$230,000 (http://www.sutron.com/pdfs/Kenya_SynopticAWS_2006.pdf)



Source, (http://www.sutron.com/pdfs/Kenya_SynopticAWS_2006.pdf)

Figure 4: Automatic Weather Observing Systems

Technical; Technical knowledge required for installation, operation and maintenance of otherwise complex AWS has slowed the impact of AWS.

Security; the installation of AWS at remote areas has proved difficult due to insecurity of the instruments.

Ineffective Information Dissemination; the channels that the KMD uses to disseminate the forecast information are ineffective; the farmers that need it most do not get it and those that do, cannot comprehend the information.

Non-User Centered Weather Forecast Information; The usefulness of forecast information provided by the Kenya's Meteorological Department to key stakeholders especially the farmers and policy formulators is not very reliable to make decisions. It would for example be desirable if the Department could inform the relevant government ministries the actual implications (in operational quantifiable terms) of weather observations e.g. it is not enough to report that; 59.8 mm of rainfall was recorded in Busia"; instead, a report saying, "59.8mm of rainfall that was recorded in Busia raised the available water resource to above the normal for this area hence it is predicted that the rains will continue for a week and this will lead to severe

floods in the low-lying areas of the Busia”. This report can be more useful to policy makers to mount rescue operations.

Factors that Affect Implementation of Technologies in Organizations

Culture; A culture is a system of shared meaning within an organization that determines in large degree how employees act. Shared values, norms and organizational practices do shape the culture that assist organizations to adopt the changes. Slowinkowski and Jarratt(1997) noted that the effect of cultural factors, specifically ‘traditions’, ‘religion’ and ‘fatality’ have greater impact on adoption of technology and must be considered with great care in adoption process. Khalil and Elkordy (1997) pointed out that the cultural sensitivities of host environments are often ignored in technology adoption decision. This is especially true in the work place since the adoption decision is often negotiated by upper-level managers who either work for international companies or who have spent time in the industrialized countries. Yet it is the lower level managers and workers who, without the diverse cultural experiences, have the responsibility of the daily use of the new technology, and ultimately accept or don’t accept it.

Human Factor; Szewczak and Snodgrass (2002) said that individuals play an effective and important role in technology adoption process. A technology is not successful if its user does not accept it. Avergou (1996) said that user participation could be considered as “Taking part” in some activity. Such participation may be direct or indirect, formal or informal, performed alone or in a group, but covering varying scopes of activities during systems development and implementation. Lin and Shao (2000) in this regard argued that the participation of users in the design and implementation of projects promote greater user acceptance.

Social Factor; The social change works into ways: it become the reason for technological change and also plays a role of a great barrier in any technology adoption decision. Godwin and Guimaraes, (1994) said that there are three factors to be considered to see social involvement in technology advances; Social need-to feel strong desire of something, Social resources-the capital, material, and skilled personnel vital for innovation and adoption of new thing, Sympathetic social ethos-an environment in which the dominant groups are prepared to consider innovation seriously and are receptive to new idea.

Organizational Structure Factor; Robbins and Coulter (2002) described the organizational structure as a framework, which is expressed by its degree of complexity, formalization, and centralization. An organization is divided into different divisions, departments, sections, teams and work groups for the purpose of smooth working and each member in the organization is given certain responsibility and authority to his position. Joan Woodward (1960) demonstrated that organizations’ structure is a significant contributor to the technology adoption, there was a distinct relationship existed between the technology and structure and the effectiveness of the organization is related to the “fit” between technology and structure.

Governmental and Political Factor; Ayeni (2004) said that technology acquisition raises a number of political questions. Such as the dependence of the receiving nations on the supplying nation and this technological dependence could become a political in the sense that it is the responsibility of a government to select carefully the country from where technology acquisition is made so that no political problems could arise in future Also, the possibility of transfer of political power from political elites to the technical specialists. This problem is more prominent in computer-based technologies because these technologies are directly related with retrieval and processing of data and information. The people at the management level are mainly from non-technical backgrounds, as a result of which there is always tension between these two groups.

Economic Factor; Lind (1999) identified that lack of awareness of available technologies and its uses, capabilities, and return on investment are greater barrier to technology adoption. Also lack of knowledge about technology selection, adoption, and implementation as well as lack of knowledge in organizational development and strategic planning restrict to the uses of new technology in organization.

Theoretical Framework

The adoption of new technologies has been studied through different theoretical frameworks, which include the Diffusion of Innovation Theory; Rogers (1995), the Theory of Reasoned Action; Fishbein and Ajzen, (1975), Technology Acceptance; Model, Davis, (1989) among others.

Theory of Reasoned Action

The Theory of Reasoned Action (TRA) was proposed by Fishbein and Ajzen (1975) to explain and predict the people's behavior in a specific situation. TRA is a well-known model in the social psychology domain. According to TRA a person's actual behavior is driven by the intention to perform the behavior. Individual's attitude toward the behavior and subjective norms are the 'loading factors' toward behavioral intention. Attitude is a person's positive or negative feeling, and tendency towards an idea, behavior. Subjective norm is defined as an individual's perception of whether people important to the individual think the behavior should be performed.

The Theory of reasoned action is a more general theory than TAM, and has been applied to explain behavior beyond the adoption of technology. However, when applied to adoption behavior, the model includes four general concepts - behavioral attitudes, subjective norms, intention to use and actual use. The inclusion of subjective norm represents an important addition when compared to TAM. In TRA, subjective norm is composed of the user's perception of how others think she should behave, and her motivation to comply with the expectations of these referents, Fishbein and Ajzen, (1975). TRA has been applied in its original form to explain the adoption of ICT-applications, Liker and Sindi (1997), but typically TRA is used as a basis for modifying the TAM-model with subjective norm as suggested above, Venkatesh and Morris, (2000). The theory of reasoned action is more general than other theories of technology adoption and therefore it's very hard to use it alone in the adoption of WSNs as it will not explain how individual reason in the adoption of WSNs in the KMD. When applied to adoption behavior, the model includes four general concepts - behavioral attitudes, subjective norms, intention to use and actual use of wireless sensor network.

Theory of Planned Behavior

The theory of planned behavior was proposed as an extension of the theory of reasoned action to account for conditions where individuals do not have complete control over their behavior. Ajzen (1985). However, this theory also included determinants of the behavioral attitude and subjective norm. Models based upon TPB have been applied to the explanation of different types of behavior, but when applied to the adoption of ICT systems or services, the model contains five concepts - behavioral attitudes, subjective norm, behavioral control, intention to use and actual use. The components of behavioral attitude and subjective norm are the same in TPB as in TRA. In addition, the model includes behavioral control as a perceived construct. Perceived behavioral control reflects the internal and external constraints on behavior, and is directly related to both intention to use and actual use. Consequently, actual use is a weighted function of intention to use and perceived behavioral control. TPB has been applied to explain the adoption of such diverse systems as spreadsheets Mathieson (1991), computer resource centers Taylor \$Todd(1995), and recently, electronic commerce services Battacherjee (2000). This theory of planned behaviour account for conditions where

individuals do not have complete control over their behavior, this theory on its own cannot be used in the adoption of WSNs as it only explain the planned behaviour of individuals in the adoption of WSNs and it doesn't account for the reasoning aspect of the individual in the adoption of WSNs. This theory only accounts for the planned behavioral aspect in the adoption of WSNs the KMD department while ignoring the other aspect in the adoption WSNs .

The Technology Acceptance Model

Technology acceptance model (TAM) has been widely used by information technology (IT) researchers to gain a better understanding of IT adoption and its use in organizations. It has been used in very different settings, e.g. to test the acceptance of: computer technology (Davis et al., 1989), online shopping (Gefen et al., 2000a), mobile computing (Wu et al., 2007), e-commerce (Pavlou, 2003), and e-Government services (Carter and Bélanger, 2005).

The theoretical foundation for TAM is based on Fishbein and Ajzen's theory of reasoned action (TRA) (Fishbein and Ajzen, 1975). Davis et al., (1989), the TAM proposed that two particular beliefs are the main drivers for technology acceptance: perceived usefulness (“the degree to which a person believes that using a particular system would enhance his or her job performance”) and perceived ease of use (“the degree to which a person believes that using a particular system would be free of physical and mental efforts). Perceived usefulness and perceived ease of use influences one's attitude towards system usage, which influences one's behavioural intention to use a system, which, in turn, determines actual system usage (Davis et al., 1989). However, the external variables that impact the perceived usefulness and perceived ease of use are not completely explored in the TAM. Davis et al. (1989) also found that attitude did not fully mediate perceived usefulness and perceived ease of use. Based on these findings, therefore, a more parsimonious TAM was suggested which removed the attitude towards usage construct from the model (Carter and Bélanger, 2005). Technology acceptance model cannot be used on its own on the adoption of WSNs as it only give the various aspect as to why people accept certain technology but fails to explain the behavioral aspect and the reasoning behind the adoption of technology, there is need to include other aspect of adoption of technology like behavioral and reasoning aspect in the adoption of new technologies like WSNs.

The Extended Technology Acceptance Model

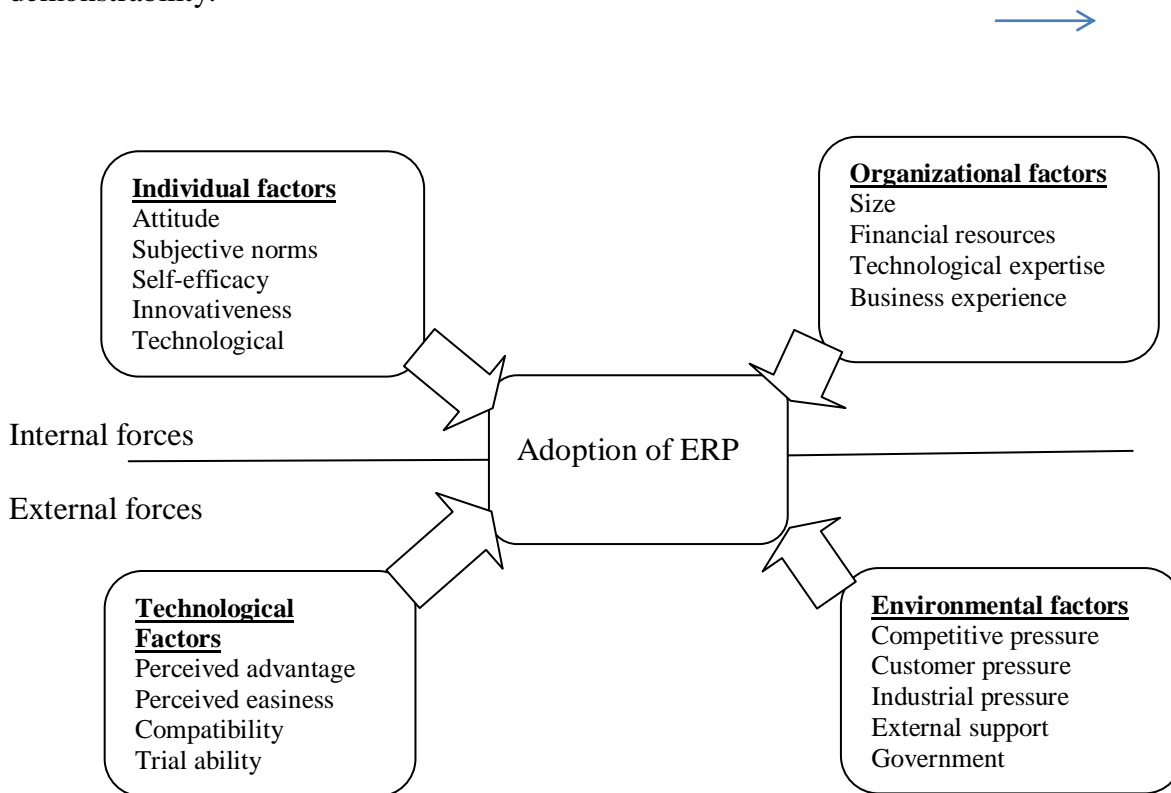
Venkatesh and Davis (2000) proposed an extension of TAM (TAM2) by adding more important determinants of perceived usefulness that is, subjective norm, image, job relevant, output quality, result demonstrability, and perceived ease of use – and two moderators – that is, experience and voluntariness (Venkatesh and Davis, 2000). In addition to this, in the TAM2, it omits attitude toward using because of weak predictors of either behavioural intention to use or actual system usage (Venkatesh and Davis, 2000; Wu et al., 2007).

Venkatesh and Davis, (2000), TAM2 consists of social influence and cognitive instrumental processes as the determinants of perceived usefulness. The social determinants are subjective norm (“the degree to which an individual perceives that most people who are important to him think he should or should not use the system”), and image (“the degree to which an individual perceives that use of an innovation will enhance his or her status in his or her social system”). The cognitive determinants are: job relevance (“the degree to which an individual believes that the target system is applicable to his or her job”), output quality (“the degree to which an individual believes that the system performs his or her job tasks well”), and result demonstrability (“the degree to which an individual believes that the results of using a system are tangible,

observable, and communicable”) (Venkatesh and Davis, 2000; Venkatesh and Bola, 2008). Experience and voluntariness were included as moderating factors of subjective norm (Venkatesh and Davis, 2000). The theory of technology acceptance model only explains why people accept and adopt new technology ignoring the psychological aspect which leads to the adoption of technology; though it explains the experience and voluntariness were included as moderating factors of subjective norm.

Innovation Diffusion Theory

The Innovation diffusion theory (IDT) is another model also grounded in social psychology. Since 1940’s the social scientists coin the terms diffusion and diffusion theory (Rogers, 1983). This theory provides a framework with which we can make predictions for the time period that is necessary for a technology to be accepted. Constructs are the characteristics of the new technology, the communication networks and the characteristics of the adopters. We can see innovation diffusion as a set of four basic elements: the innovation, the time, the communication process and the social system. Here, the concept of a new idea is passed from one member of a social system to another. Moore and Benbasat (1991) redefined a number of constructs for use to examine individual technology acceptance such as relative advantage, ease of use, image, compatibility and results demonstrability.



Source, Roger (2003)

Figure 5: Model for adoption of ERP

According to diffusion of innovation, the likelihood that an innovation will be adopted depends partly on its attributes. The following have attributes are considered in diffusion of innovation: relative advantage, compatibility, complexity, observability, and trialability. Basically these attributes are economic in the sense that they relate to how much effort must be expended in adopting compared with the benefits of adopting, especially compared with the costs and benefits of not adopting.

Relative advantage is the degree to which an innovation is perceived as being superior to its precursor, which is either the previous way of doing things (if there is no current way), the current way of doing things, or doing nothing. The superiority of an innovation is not only measured in economic terms but also may also be expressed in terms of enhanced personal status or other benefit terms. The higher the perceived relative advantage, the higher the rate of adoption, all other factors being equal. Note that perceived relative advantage of an innovation involves both perception (evaluation) of the proposed innovation as well as perceptions of other candidates and the status quo. It is not uniquely tied to objective characteristics of the innovation although, of course, perceptions usually, but not always, are influenced by objective reality. Also, relative advantage must take into account “relative advantage for what?” What is the task to which the innovation is being put into operation?

Compatibility is the degree to which an innovation is perceived to be consistent with existing social cultural values, needs, and past experiences of potential adopters. Compatibility is positively correlated with the rate of adoption. In developing countries, cellular telephony is directly compatible with the need for mobility for the urban poor, who often do not have the luxury of long-term fixed addresses and whose lifestyles dictate that they are often in transit and do not have access to fixed lines.

Complexity is the degree to which an innovation is perceived as being difficult to understand and use. This attribute correlates negatively with the rate of adoption.

Observability is the degree to which the results of an innovation are visible to others. In some innovation, it is easy for others to see the results of adoptions from those who have already adopted the technology. However, this is not the case with all innovations. Moore and Benbasat (1991) split observability into two: result demonstrability (the ability to demonstrate that positive results have occurred for the user) and visibility (the ability to share those demonstrations with others). Observability is positively correlated with the rate of adoption. To the extent that something has to be explained in complicated ways to others (complexity), it becomes less “observable,” too. Language and culture might also affect observability for text-oriented technologies. Abstract or ambiguous innovations are generally difficult to observe and therefore diffuse slowly. Rogers gives safe sex as an example of innovations with low observability due to its ambiguity.

Trialability is the degree to which an innovation may be experimented with on a limited basis before adoption without undue cost. Trialability is sometimes linked to divisibility of an innovation (Niederman, 1998). Trialability/divisibility is “the degree to which an innovation can be adopted in phases, with each phase potentially leading to a greater adoption” (Niederman, 1998, p153). Trialability might also be influenced by cultural values, the task and its associated stresses, and even social influence (particularly where others might be observing the trials). Innovations that can be tried in pieces are inherently more trialable than those for which the entire technology has to be mastered before any use can be made. In these latter cases, the “trials” are often simply unproductive and unconvincing play-acting or marketing.

Moore and Benbasat (1991) added voluntariness of use and image to Rogers’ five attributes. An innovation is most likely to be adopted if individuals perceive that the adoption enhances their images within the social

system. Rogers includes this concept under perceived relative advantage. Voluntariness of use is defined as “the degree to which use of innovation is perceived as being voluntary or of free will.

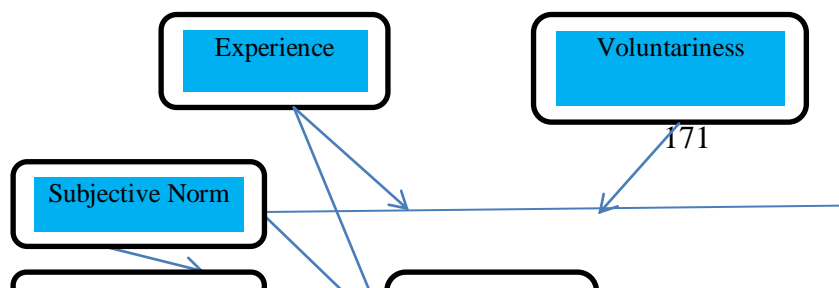
Analysis of the Frameworks

Theory of Reasoned Action	Theory of Planned Behavior	The technology acceptance model	The extended technology acceptance model	Innovation Diffusion Theory	Proposed framework
Attitude	behavioral attitude	behavioral attitude	subjective norm	Relative advantage	Relative advantage
Subjective norm	subjective norm	subjective norm	image, job relevant	Compatibility	Compatibility
intention to use	Perceived behavioral control	perceived usefulness	output quality	Complexity	subjective norm,
actual use		Perceived behavioral control	result demonstrability	Observability	Observability
			perceived ease of use	Trialability	Trialability
				voluntariness and image	voluntariness and image
					actual use (adoption of WSNs)

The theory of reason action can be used in the adoption of WSNs, though it lack some important aspect that are crucial in the adoption of WSNs, these include construct like benefits of adoption it only deal with the social psychology aspects as to why people adopt technology. The theory of planned behaviors, the role of subjective norm in TPB when compared to TAM is however somewhat unclear. This theory only explains the behavioral aspect though it doesn’t explain why people adopt technology. The theory of technology acceptance model only explains why people accept and adopt new technology ignoring the psychological aspect which leads to the adoption of technology. The theory of extended technology acceptance model only explains why people accept and adopt new technology ignoring the psychological aspect which leads to the adoption of technology; though it explains the experience and voluntariness were included as moderating factors of subjective norm. The proposed framework will incorporate the major aspect of the other entire model.

Framework For Adoption of Wireless Sensor Networks

The suggested framework suitable for adoption of WSNs in weather forecasting practices in Kenya was derived from the literature, survey of the KMD division , interaction with theory of theory of reasoned action, theory of planned behavior , the technology acceptance model, the extended technology acceptance model and innovation diffusion theory and the Study carried out on KMD in Kenya. From the reviewed literature, the framework in figure 2.8 was adopted for studying the adoption of WSNs at KMD.



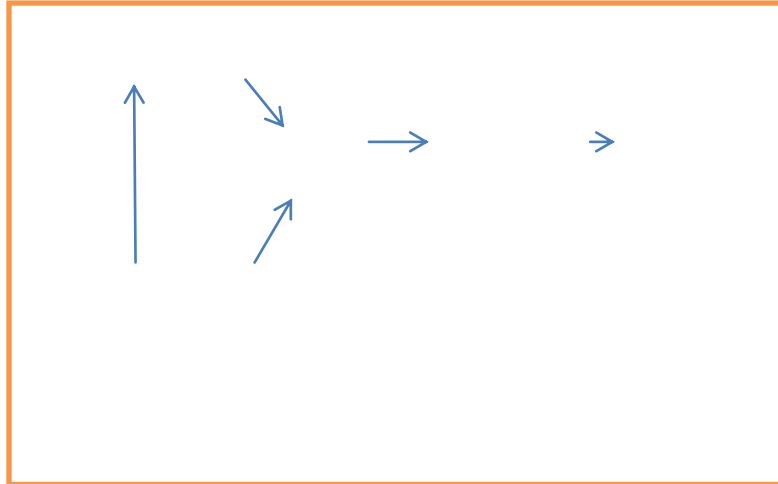


Figure 6: Framework of Adoption of Wireless Sensor Network

Below are the components of the Conceptual Framework:

Compatibility is the degree to which an innovation is perceived to be consistent with existing social cultural values, needs, and past experiences of potential adopters. Compatibility is positively correlated with the rate of adoption. In developing countries, cellular telephony is directly compatible with the need for mobility for the urban poor, who often do not have the luxury of long-term fixed addresses and whose lifestyles dictate that they are often in transit and do not have access to fixed lines. Compatibility will be the degree to which a WSN will be perceived to be consistent with existing social cultural values, needs, and past experiences of potential adopters in the KMD.

Trialability is the degree to which an innovation may be experimented on a limited basis before adoption without undue cost. Trialability is sometimes linked to divisibility of an innovation (Niederman, 1998). Trialability/divisibility is “the degree to which an innovation can be adopted in phases, with each phase potentially leading to a greater adoption” (Niederman, 1998, p153). Trialability might also be influenced by cultural values, the task and its associated stresses, and even social influence (particularly where others might be observing the trials). Innovations that can be tried in pieces are inherently more trial able than those for which the entire technology has to be mastered before any use can be made. In these latter cases, the “trials” are often simply unproductive and unconvincing play-acting or marketing. Trialability will be the degree to which WSNs will be experimented on a limited basis before adoption without undue cost.

Behavioral intention; Masrom and Hussein (2008) define behavioral intention as a measure of the strength of one intention to perform a specific behavior especially the use of an information system. Harthorne and Ajjan (2008), explain that behavioral intention is the most important predictor of actual behaviour when the user has form a stable intention to take a specific intention. Behavioral intention will be the measure of the strength of one intention to perform a specific behavior especially the use of WSNs.

Subjective norm; Subjective norms explain how the behavior of an individual is influence or change based on how other important people to him/her think he/she should behave. Fishbein and Ajzen (1975) define

subjective norm as the person's perception that most people who are important to him think he should or should not perform the behavior in question. Subjective norms will explain how the behavior of an individual will influence or change based on how other important people to him/her think he/she should behave

Perceived usefulness; Davis (1989) explain that perceived usefulness (PU) is “the degree to which a person or a user believes in using a particular technology, as well believes that the technology would enhance his/her job performance.” Thus, belief, attitude, and intention have been identified to have link with PU. However, many attempts have been made to look at PU from user belief and attitude by stream of researchers. A belief that a user develop about information systems explains how he/she perceived it usefulness. According to Hsu and Lin (2008), people's beliefs about blogging to an extent influence their participation in blogging. Moreover, belief in certain thing influences the behaviour intention toward such thing. Hsu and Lin (2008) posited that since social networking site such as blog is a voluntary act used for social interaction, therefore, a user is expected to be intrinsically motivated, which may lead to forming a perception that using social networking site is useful. Perceived usefulness will be the degree to which a person or a user believes in using WSNs and that the WSNs will enhance his/her job performance.

Perceived ease of use; Aside PU, Davis (1989) also posits that perceived ease of use (PEOU) was another determinant for users' acceptance of information system. Perceived ease of use is defined as “the perception about the degree of effort needed to use a particular system,” by implication “ease” is conceptualized as “freedom from difficulty or great effort” (Lee et al., 2003). According to Gangartharabatha (2009), PEOU is assumed to mean internet self-efficacy when it comes to social networking site usage. Bandura (1982) posits that self-efficacy is “the belief in one capability to organize and execute a course of action required to manage a situation.” That is to say, self-efficacy is a person's belief in his/her ability to perform a specific task. Perceived ease of use is the mean to use WSNs.

Conclusion

As discussed in this paper the current weather forecasting practices in Kenya are not satisfactory, thus the need for adoption of WSNs in weather forecasting practices in Kenya. KMD faces various external challenges which affects weather forecasting, which necessitate the need to adopt WSNs in the weather forecasting practices in Kenya.

Recommendations

This paper recommend that the possible solutions for KMD creating awareness of the new technologies in the weather forecasting practices,improving staff training on new technologies in weather forecasting , installation of more weather stations, more research to be done to explore new and efficient methods of weather forecasting, use of mobile technology in the dissemination of information on weather, employment of qualified personnels and government financial inputs

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A cloud computing architecture for e-learning platform, supporting multimedia content

by

Attlee M. Gamundani*, Taurayi Rupere ** & Benny M Nyambo

Abstract

E-learning based platforms that support multimedia content to enhance interactive learning demands large disk space. Despite research ground covered under e-learning circles, less attention has been devoted to solicit the best methods to address the disk space challenges at minimal cost. This research focuses on advancing a best architecture that meet the need for storage space when developing interactive multimedia e-learning based portals. Simulation was used using the CloudSim toolkit. Findings show that to precisely test the performance of viable architectures, there has to be a robust platform for such experiments. The main conclusions drawn from this research were that, there is room to improve on existing architectures to scale down on development costs so attributed to e-learning portals that are interactive in stature. Storage can be built from exiting personal computers through harnessing the cloud computing functionality designed as most of the personal computers are not fully being used by their owners. This research culminates by recommending the need to explore on best simulator packages that can be used to test the functionality of cloud computing based architecture for e-learning environments.

Keywords; E-learning, Multimedia, Architecture, Cloud Computing, Storage, Simulation, Interactive

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introduction and background

E-learning based platforms that support multimedia content to enhance interactive learning demands large disk space [1]. To curb the challenge of disk space and decongest the server(s) what should be done? In setups where there is a pool of networked computers or computers that can join a network for a dedicated period, what is happening to all the idle space and processing power? What solution is there to the storage space challenge for e-learning platforms that supports multimedia content? A close glance at a simple e-learning structure as presented in Fig 1. below depicts the three main players in the e-learning ecosystem as the e-learning server, the network and the e-learning client.

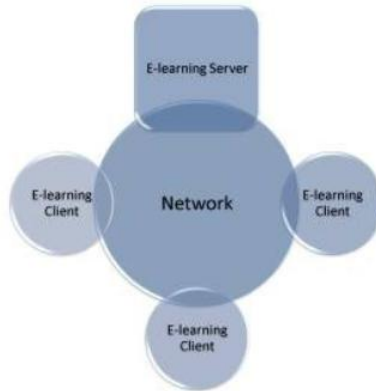


Figure 1: *E-learning System* [1]

Paradoxical to this illustration, many depicts the existence of e-learning clients as the dominant player, there is in that light a single network and a single e-learning server, though scientifically it can mean two different words in different formats. There is little attention being paid in most researches on e-learning based systems on how best the e-learning clients can also contribute to the server space and thereby increase throughput to e-learning based systems.

As reference [2] posits that “Learning management systems (LMS’s) are already made available in SaaS model, but for most LMS providers, cost structure for providing LMS in SaaS model is currently governed by ‘old’ way of server infrastructure management (in-house or rented), which is then as-is passed on to the customer”. It is on this background highlighted above, that part of this research work is built upon. There is cost involved in hosting e-learning systems, the stages at which such costs weather in monetary terms or otherwise needs to be traced and constituted individually to specific development stages of the e-learning life cycle. There is greater opportunity to explore the best ways in which certain costs could be minimized or avoided if proper attention is given across the spectrum. The rest of the paper is organized as follows: section 2 gives the problem definition and research questions; section 4 gives a brief literature about cloud computing architecture in e-learning environment followed by the methodology and research design. The results and analysis follows proceeded by the discussions, conclusions and recommendations.

problem statement

The main focus of this research following the background information outlined above, therefore was to explore the best resources available that can alleviate the challenges many e-

learning system developers face especially for platforms that carry a substantial volume of multimedia content. The problems experienced in e-learning systems as a medium used to enhance learning and dissemination of information has particularly contributed to the formulated pilgrimage towards a solution that can best be implemented in e-learning systems. The search for such a solution was in light of addressing the challenges at the grass root level that is at the development stage of e-learning systems. Having observed that many institutions are able to launch and host e-learning based systems to enhance their learning criteria, there is a limitation of storage space.

In trying to address a challenge herewith presented reference [3], posits that “The process of E-learning is not a perfect one.....Course material used in e-learning sometimes is unattractive and non-compelling.” Also [4] highlighted that “Business divisions who have special and particular needs and mid-size and small companies continue to face stiff challenges and financial crunch to implement e-learning programs and solutions to fit their scale. ”

To address this challenge, there was a motivation to look at the best cost cutting and resource efficient way in which e-learning systems can be developed and deployed at scales that best suits the business or institutions’ requirements. In particular, attention was given to storage capacity as one of the variables that demands some huge financial investments as sometimes a substantial volume of space is required, which in turn triggers sourcing of more servers to meet the ever increasing demand for space.

One of the features that strongly are a check list when testing the quality of e-learning systems as highlighted by[5] that “..... as the subject of the course is state of art and thus should be updated regularly. There should be high level of interaction as well...,”. This indicates multimedia content based e-learning systems are the solutions called for, however to host such e-learning platforms in a cost effective routine, what avenue can be followed?

RESEARCH QUESTIONS

The paper seeks to answer the following main research question: Is there an appropriate architecture that meets the needs of storage space and be used to host e-learning systems built with multimedia content to enhance interactivity in learning circles?” Sub questions emanating from the main research questions are:

- What are the other e-learning architectures that support multimedia content?
- How are the current e-learning architectures effective and assessed?
- Can we come up with a suitable architecture for multimedia e-learning systems with solve the need for storage space compared to existing one?

LITERATURE REVIEW

E-learning architectures supporting multimedia content

E-learning involves a broad combination of processes, content and infrastructure that uses computers and networks to scale or improve learning parts including the management and delivery [6], [3], [7]. While architecture integrates various components, that consists the public side of interface[8], broken down into parts [9] that involves functionality, usability, performance, reuse, economic and technology [10].

The IMS LIP final specification by [11] does provide the following structures to support the implementation of "any suitable architecture" for learner privacy protection. However focus was more centred on addressing privacy principles as depicted in fig 2 below.

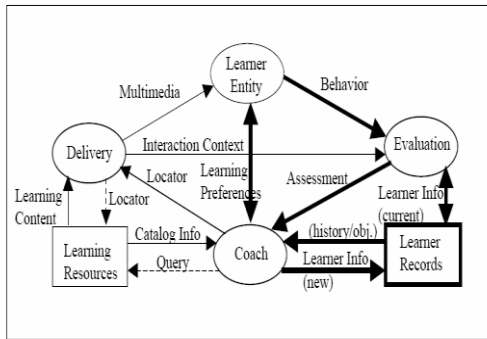


Figure 2: *LSTA system components* [11]

A close look at this architecture clearly show the display of learning resources and multimedia components for this setup is not being housed under a single shell. There is a possible danger in slowing delivery of the e-learning resources to end-users in such an architectural setup. It is much convenient to compute delivery latency at a go than at different delivery levels. This is pointed out by reference [1] that “As with rapid growth of the cloud computing architecture usage, more and more industries move their focus from investing into processing power to renting processing power from a specialized vendor.”

From this nugget, the cloud computing architecture presented here is availed on rental from a specialised vendor. This pause an opportunity to look on how best users or organisations can be specialised vendors in own capacity to effectively make use of the available resources. Also [3] and [4] pointed out that “The technical standards for connecting the various computer systems and pieces of software needed to make cloud computing work still aren't completely defined”.

Well, cloud computing maybe presented as a viable architecture as indicated here, there is still a loophole that needs research attention in light of being able to define computer systems and pieces of software that will enable the cloud computing architecture a worth tool for use. Reference [4] posits that “Every decade or so, the computer industry's pendulum swings between a preference for software that's centrally located and programs that instead reside on a user's personal machine. It's always a balancing act, but today's combination of high-speed networks, sophisticated PC graphics processors, and fast, inexpensive servers and disk storage has tilted engineers toward housing more computing in data centers. In the earlier part of this decade, researchers espoused a similar, centralized approach called "grid computing." But cloud computing projects are more powerful and crash-proof than grid systems developed even in recent years.”

The effectiveness of E-learning architectures

A close glance at the following case study unveils some of the focus that the implemented e-learning systems architectures were inclined towards: Researcher [11] pointed out that “*However, most of them are focusing on content management, meta-data specification, or other areas with little reference to security and privacy. For example: - The AICC focuses on practicality and provides recommendations on e-learning platforms, peripherals, digital audio and other implementation aspects. - The ARIADNE focuses mainly on meta-data specification of electronic learning materials with the goal of sharing and reusing these materials.*”

It is easier to advance a solution that addresses how to host content alone based systems than multimedia content based systems. This presents a great challenge to the e-learning design and implementation chores as a result, there is great need to explore this avenue in a holistic approach.

ADL-SCORM is mainly concerned with specifying how instructional content should be treated [11], [12]. Instructional content is mainly descriptive in nature, well if it embeds multimedia in it, the focus inclined by ADL-SCORM review are towards handling not hosting of such instructional content. As an additional requirement to produce a complete piece of work, the need to complement efforts made by advancing a possible hosting architectural setup that can both house the instructional content and provide elastic space for future storage needs, cannot be overemphasised.

Cloud computing delivers infrastructure, platform, and software that are made available as subscription-based services in a pay-as-you-go model to consumers. These services are referred to as Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) in industries [1]. Being an emerging discipline, the cloud computing setup still passes to be high cost option and deterring to some users. It is noble to explore better ways in which this model can be used hence implemented on a low to no cost range [13], [14].

The current cloud computing architecture involves the existence of data centers that are able to provide services to the clients located all over the world. In this context, the cloud can be seen as a unique access point for all the requests coming from the customers/clients. It is from this setup that a motivation to conduct this research so as to identify the best ways in which the datacenter components of the architecture can be localized and make use of available resources to the maximum potential is obtained. Even if it seems not very reasonable, the cloud computing provides some major security benefits for individuals and companies that are using/developing e-learning solutions, like the improved improbability. It is almost impossible for any interested person (thief) to determine where is located the machine that stores some wanted data (tests, exam questions, results) or to find out which is the physical component he needs to steal in order to get a digital asset. As such, benefits presented by the e-learning architecture are recipe enough to aid exploration of best options to advance solutions hosted in the same fashion [1].

The fact that cloud computing has the most unique characteristic of virtualization makes possible the rapid replacement of a compromised cloud located server without major costs or damages. It is very easy to create a clone of a virtual machine so the cloud downtime is expected to be reduced substantially;

The other security benefits that accrue to cloud computing presented here are:

- centralized data storage – losing a cloud client is no longer a major incident while the main part of the applications and data is stored into the cloud so a new client can be connected easily and fast. Imagine what is happening today if a laptop that stores the examination questions is stolen [1].
- monitoring of data access becomes easier in view of the fact that only one place should be supervised, not thousands of computers belonging to a university, for example. Also, the security changes can be easily tested and implemented since the cloud represents a unique entry point for all the clients [1]. Hence it exposes one feature worthy pursuing- the data center for centralised control and management of resources [4], [12].

Upon analyzing these, it is expensive to secure servers, but why not use idle space in most of personal computers around say in an institution setup where there is potential to have a pool of

computers that can join a network setup. How much cost can be reduced by exploiting such an avenue?

The following subsections will look into the tools that shall act as a basis for testing the proposed architecture for validation of this research.

The Resource Allocation algorithm

Following functionality of architectures reviewed, it is ideal to look at literature that explain the sole functionality of the resource allocation algorithm to ensure that there is sanity at the datacenter, by efficiently monitoring tasks in their various states of execution; the datacenter is in a position to precisely monitor its pool of resources. Resource allocation here is in a dynamic fashion, in that user requests are unpredictable and disk space requested varies with an application being developed.

We advanced a resource allocation algorithm that was tested and proven for its efficient management and monitoring of resources at the datacenter by [15], in their research on Dynamic Resource allocation in computing clouds through Distributed Multiple Criteria Decision Analysis.

```
ResourceAllocation ≡
Choose  $t$  in  $taskpool(self)$  with  $taskStatus(t) = unassigned$  do
Let  $n = placementNode(t)$  in
If  $n \neq undef$  then
RequestResourceLock ( $n, t$ )
 $potentialNode(t) := n$ 
 $taskStatus(t) := allocated$ 
setTimer( $self, t$ )
else
Warning (“Cannot find suitable node”)
```

The execution being done by the algorithm above is straightforward in nature in that, a task is checked for its status from the task pool or table, a task that has an “unassigned” state, is picked and a Node is identified from the pool of nodes. Once a Node is allocated to a task and its confirmed it can execute the task requests with resources available (a functionality of the agent assigned at the node that constantly communicate with the datacenter agent of that node), the node to engage itself in a “Lock” state so that when the next round robin check of available nodes is done, the node is skipped. It is the node agent that has the functionality of creating virtualized processors for a dedicated period of the task’s execution processing cycles.

A task will only be considered executed if a commit confirmation status is reported back to the datacenter agent by the assigned node agent. Otherwise the datacenter agent reports a reschedule of the task to a node that can execute the task completely.

The Cloud sim simulator

What formulates the CloudSim architecture as a simulation tool, as illustrated by Fig 3 below, which displays the various layers of the simulator, suffice to select it as the right tool for this research task. It is from this dimension that one can safely indicate that the CloudSim tool is fully packed with structures, modules and the test environment that enable modeling of cloud computing architectures before their execution into real clouds. It is a tool that minimizes the risk of unqualified results or decision points. Simulation for this research using the CloudSim tool, will be done at the CloudSim simulation layer which provide support for modeling and simulation of virtualized setups, data center setups as well as dedicated management interfaces for virtualization variables such as memory, storage and bandwidth. The fundamental issues such as provisioning of hosts to VMs, managing application execution, and monitoring dynamic system state are handled by this layer. It is therefore at this layer that the efficiency of resource allocation criteria chosen is tested. Such implementation can be done by programmatically extending the core VM provisioning functionality [16], [17], [18].

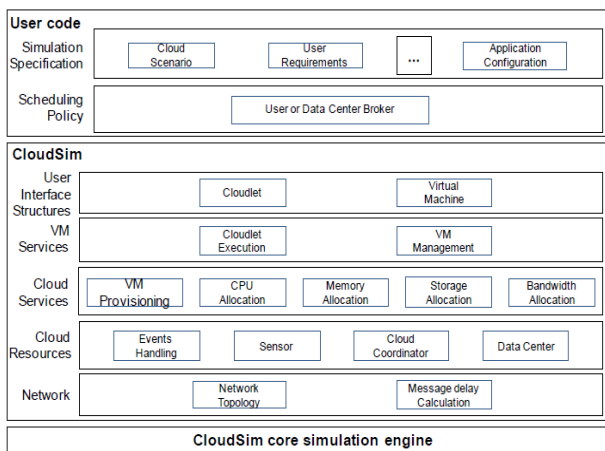


Figure 3: Layered CloudSim architecture by [16],[17],[18]

The top-most layer in the CloudSim stack is the User Code that exposes basic entities for hosts (number of machines, their specification and so on), applications (number of tasks and their requirements), VMs, number of users and their application types, and broker scheduling policies.

Host is a CloudSim component that represents a physical computing server in a Cloud: it is assigned a pre-configured processing capability (expressed in millions of instructions per second – MIPS), memory, storage, and a provisioning policy for allocating processing cores to virtual machines [16]. The existence of this feature in the CloudSim simulator makes it an ideal simulator for use in this research, where the Host will represent personal computers that have the capacity to lease space to datacenter building.

methodology

The researchers proposed and came up with architecture for building a cloud computing IAAS architecture making use of the pool of available high computing power say in an institution setup where one can have the privilege of say more than hundred (100) computers in operation at any given instance. An algorithm for resource allocation is implemented that allocates resources in a

cloud computing architecture setup at the datacenter. Performance of the resource allocator algorithm will give a fair analysis of the viability of the proposed architecture. There are variables that were held constant such as the network bandwidth, machine processing power and uptime and downtime of machines is presumed and set at predictable intervals.

The Cloudsim Simulator was used as the main tool for the simulation of the algorithm for resource allocation, which dynamically allocate resource, why dynamic? The selection of a dynamic approach to resource allocation is in light of the fact that, user demands and intervals for resource request and apportionment is not uniform; it varies from time to time.

A resource allocation algorithm that dynamically allocates resources is going to be advanced to the CloudSim tool; its performance shall form the basis for data collection in the form of graphical representation of variables being tested per given test case. It is an analysis of the graphical performance of each test case against defined variables that this research will be able to pass conclusions thereof.

The Proposed Architecture

The architecture being proposed by this research is in light of building a cloud computing IAAS, architecture. After such an initial design, what needs to be explored further is how the storage space is going to be managed? Where will it be managed from? Who will be managing storage? Why does one need the space?

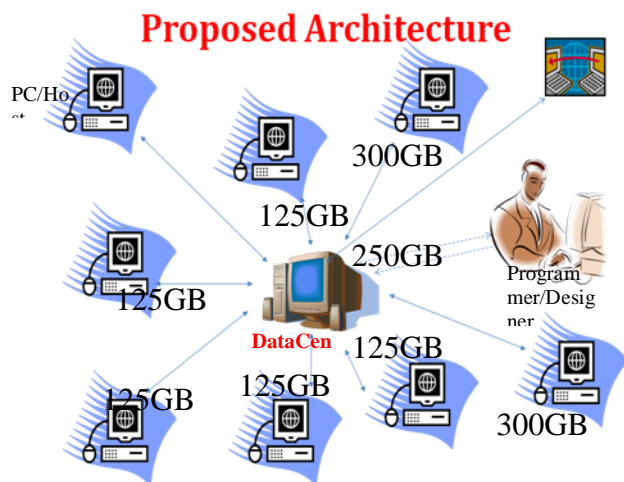


Figure 4: *Proposed architecture diagram*

As depicted in the diagram above, resources (i.e. disk space) is being forwarded to a central computer labeled “data center”, which implies, this is the hub of this setup. Given such a scenario, one now need to strategize on how best to manage this pool of storage space and subsequently be in a position to allocate it to requesting applications in this instance, users are specifically concerned about creating a pool of storage capacity and processing power to be in a position to host an e-learning portal that can incorporate multimedia content to enhance interactivity in the learning environment.

The Functionality of the Proposed Architecture

The functionality of this proposed architecture mainly revolves around the datacenter activities in acquiring, managing and allocating disk space to application requests in the

operability of the e-learning system. It will be noble to have an algorithm that efficiently manages the pool of resources at the datacenter. Since the datacenter will be the main control board, the Nodes/personal Computers will communicate through the datacenter. It is the datacenter's responsibility to have an update status of each and every node so that at every request for resource allocation it can route the request to a node that has the necessary resources to host that request. Basically there are a set of activities that transpires at the node and the rest of core activities are centrally executed at the datacenter, all the same the monitoring and management of those activities is centrally done at the datacenter.

The Node activities that the datacenter monitors can be summarized as in Fig 5.

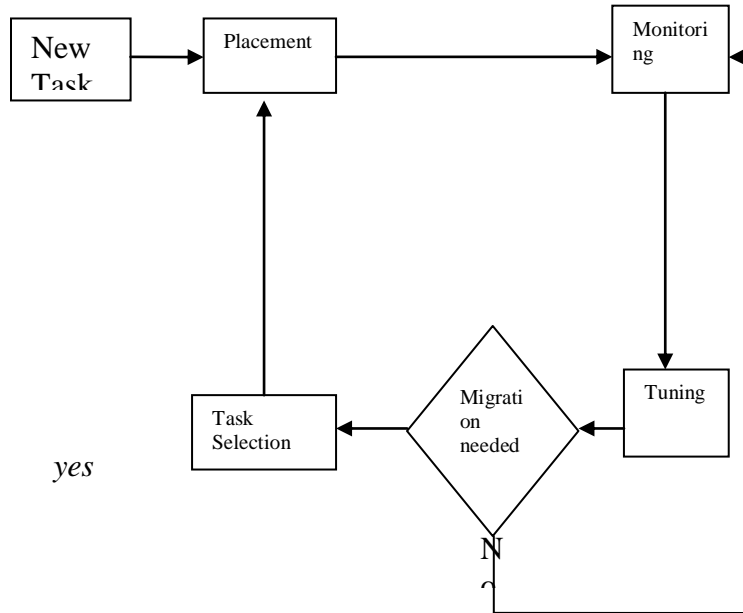


Figure 5: Node Activities

These activities will be monitored at the datacenter; it is not the node's responsibility to execute these processes. As a consequence of this setup, there is a possibility of a pool of resources at the datacenter that need to be monitored in terms of their state at any given instance. It is also the responsibility of the datacenter to populate its task bank with statuses of each task. Ideally the tasks can either be in a state of "unassigned" implying it will be waiting in the queue for execution. In another state, a task can either be "allocated," which implies it would have been allocated to a specific node, in the allocated state, the node may be busy or taking forever to finish execution of its tasks, there may have to be "migration" decisions to reassign it to another node, if it is successfully find a processing slot, it will be in the "running" state. A successful processed task should have "commit" state.

Hosts **Results and Analysis**

In this section we report on the findings from the simulation of the proposed architecture's functionality. In the first instance, the results of the simulation are discussed. Findings are

compared to the findings in the literature review. The graphical displays presented in the following review are the main output from the simulation done using the CloudSim simulator.

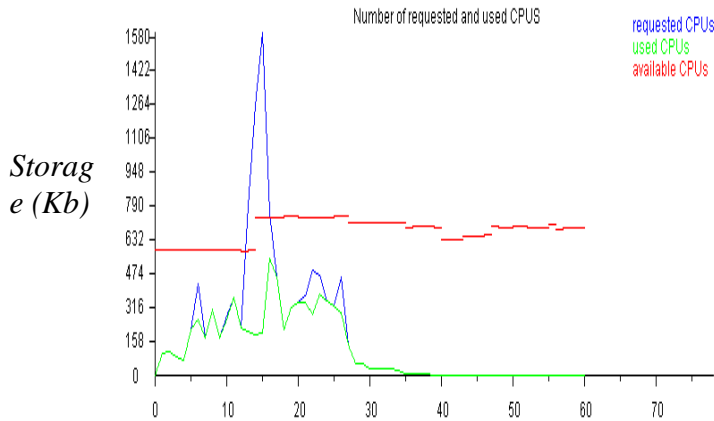


Figure 6: *Graph of Requested and Used CPUs*

As represented in the Figure 6, the nature of distribution patterns for requested CPUs, used CPUs and available CPUs projected over a period of an hour, is such that there may be a high demand for CPUs during the initial 10-20 minutes once the CPUs to the requested number are gathered, one will have a normal performance in resource scheduling at the datacenter for any demand for CPUs in this instance, the main agenda is to build up as much storage and processing power as possible.

Figure 7 shows the average machine usage per hour. It is clear that during the 10-20 minute peak period the average machine usage is up because of the high concentration of jobs at the datacenter.

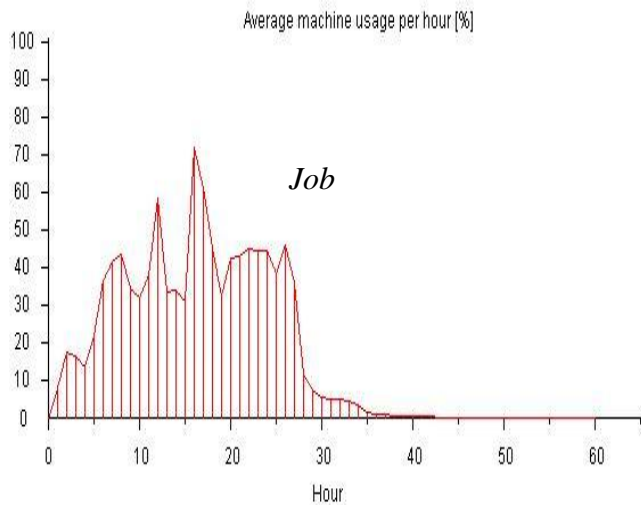


Figure 7: *Graph of Average Machine Usage per hour*

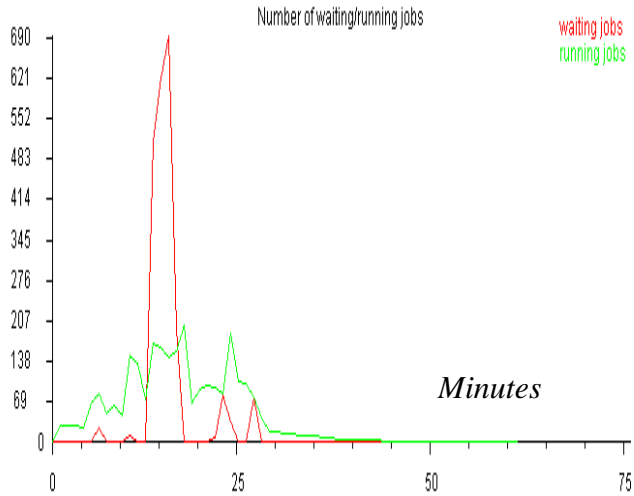


Figure 8: *Graph of Number of Waiting /Running Jobs*

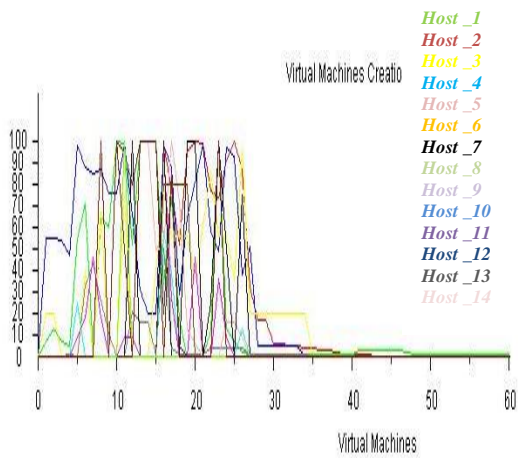


Figure 9: *Graph of Virtual Machine Creation (%)*

As in the previous graphs, the graph in Figure 8 depicts the same nature of functionality at the datacenter revealing almost the same trend. There is generally a sizeable number of waiting jobs during the same 10 -20minute peak range spelling a deficiency in availability of resources.

This display is somehow devoid of other previous representations, for the fact that, it now displays the concentration of creation of virtual machines, at Host machines, to meet the resource processing requests at the datacenter. It is not easy to follow the pattern formulated here as it is highly clustered in nature. Basically, Virtual machines are created as and when needed, at the same time, they are destroyed as and when they have finished processing jobs assigned to them. As virtual machines are highly depended on host machines, there is a general trend that such virtual machines' viability highly depends on the availability of a host, thus why it is important to observe the functionality of this variable, how it operates within the vicinity of the hosting machine.

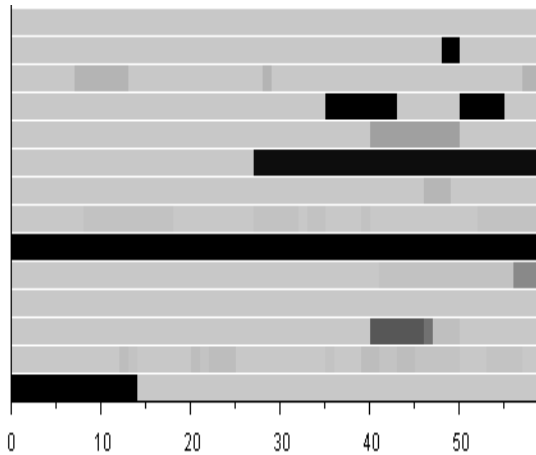


Figure 10: *Graph of Percentage of failed CPUs per hour (%)*

The representation is closely linked to the previous graph on virtual machine creation. The test for failed CPUs/Hosts is necessary to statically populate the datacenter control table so that hosts that are no longer functional are removed from potential pool of resources. It is one of the functionalities of the datacenter to continuously update its storage capacity, processing power and the need for further resources, so that queues are minimized. This improves the functionality of the resource allocator algorithm at the datacenter.

Analysis and Synthesis of Results

The simulation results from the expected functionality of a normal cloud computing architecture based on results of typical simulations using the CloudSim simulator are normal. The big challenge however, is the existence of testing metrics to quantify the results to reach a precise conclusion. From a qualitative analysis, the results are averagely in a functional order for the set of variables that were advanced for this typical simulation where concentration was mainly channeled towards the allocation, execution, virtualization and host usage. If one produce an output for use to the e-learning community, one would strongly recommend further tests using any viable tools of the same architectural functionality advancing a variation of variables not only limited to what this research might have sampled in reaching its conclusion. The architecture may perform differently under different network setups, especially considering the fact that network bandwidth as one of the determinant factors of functionality that can have enormous contributions either negatively or to a certain screwed direction was not tested for lack of proper technology for a testing environment, the existing simulators for cloud computing that supports both a test for virtualization and network topology are expensive to implement and in most cases not easily accessible to the learning community.

If one were to pass a rating of the results of this simulation based on the qualitative analysis, one will graduate our confidence rate at 60%, implying the results reliability is set at the same rate, for a number of solid reasons, some already highlighted above. A simulation and a real world setup are two unique environments, simulations are easy to manipulate and results so produced will have a partiality towards the test variable being tested, this is a different scenario with real operational environments were all the environmental variables imposes their existence at untimed intervals.

Another factor which also worries could be the shift of trend of results is the latency rate, for the purposes of this research such a variable was not tested, however its contribution to the overall performance of the proposed architecture is one that cannot completely be ignored. Therefore, there is still room to improve the decision points reached by this research if better metrics are advanced and better tools for simulation are also used.

Conclusions

After this research we made the following conclusions:

There are deterrents to hosting of scalable e-learning platforms that need to be addressed fully and logically, that will see a better equipped e-learning environment. The e-learning community and a pool of researchers still have a long way to go in soliciting detailed information on cost effective ways e-learning platforms can be build, hosted, run and maintained.

There is still room to scale down on available options to cater for the low to no cost applications for the architectures available for hosting e-learning platforms. Research in the cloud computing architecture simulators is still very tentative and lacking on precision.

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Framework for examining firewall operation using network intrusion detection systems

By

Kemei P. K.* & Mbugua J.K.**

Abstract:

In the last few years, the intranet and Internet has experienced explosive growth due to number of benefits. Internet is insecure which makes security of private networks system an imported limitation. Firewall is installed as the first step of securing private networks. Firewalls are implemented at the block point of private network to protect them from external attacks through restricted defined rules and policies reaching network interface. Regular complaints have been raised due to invasion, intrusions and attacks of private networks even with the presence of firewalls. For purpose of confirmation, real time framework needs to be implemented to observe, examine effectiveness and functionality of firewalls by installing Network Intrusion Detection Systems (NIDS) security software within network perimeter to examine firewall operation. NIDS detects, offensive, inaccurate, or irregular action on a network and they are proper for any types of institute for defending the networks and systems. By setting up framework according to defined rules and policies deviation are reported automatically where administrator can check the events examined or audit to check if the firewall complies according to configured rules or policies where some are complex and high-level to implement all rules setup. The reported events enable the administrator to enforce and implement the appropriate rule which make the network safer to use.

Keywords: Firewall, Networks, Intrusions, Detection, Framework.

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Introduction

Intrusions and attacks are the main threats against networks and information security. With rapidly growing illicit activities in networks, intrusion detection systems as a component of defense- in-depth are very necessary because traditional firewall techniques cannot provide complete protection against intrusion (Kobayashi, 2003). NIDS have become an essential component of computer security to detect these attacks before they inflict widespread damage (Richard, 2000). They are used to monitor the usage of such systems and to detect the apparition of insecure states. They detect attempts and active misuse by valid users of the information systems or external parties to abuse their privileges or exploit security vulnerabilities (Herve, 1999). NIDS make a robust application for identify, recognized and response from security violations, it needs the framework that cooperates with connected and related several components for accurate, intelligent adaptive and extensible with composite to an integrated system (Deris, 2011).

The main aim for integrating NIDS with a firewall includes filtering, management of update data set, the sensor can take dissimilar actions based on how they are configured and event reaction process. Security policies are decisive step to secure exacting system since it identifies the security properties. There are strong confirmation that the installation of up to date NIDS system that are position at the perimeter can defer significant protection for networks (Craig, 2009) which supplement major shortcomings of firewall.

Literature Review

Firewalls utilize static, manually configured, security policies to differentiate genuine traffic from non-genuine traffic. They prevent illegal external users from accessing computing resources on the internal network, avoid the negative untrusted relations impact of a break in, provide a reliable connection to the Internet where users do not implement their own insecure private connections and control internal user access to the outside network to prevent the export information. They inflict security policy allowing only permitted services to pass through and only within the rules set and policies. They log Internet activity efficiently since all traffic passes through the firewall; provides a excellent place to gather in sequence about system and network use and exploitation. As single point of access, the firewall can verify what occurs between the protected network and the external network. They limit disclosure, where they keep one section of site's network split from another section. They can maintain problems that concern one section from diffusing through the entire network. In some scenario, one section of the network may be more trusted than another depending on data sensitive systems. They are focus for security decisions since all traffic in and out must pass through the firewall. They give an enormous amount of advantages for network security by let's directed security measures on firewall network connects to the untrusted networks. Focusing security in firewall becomes more proficient, controllable, and less costly than spreading defense decisions and technologies trying to cover all the bases on packets where they can be examined and evaluated. They control all incoming and outgoing traffic since they are placed at the point between the untrusted and trusted network according to the defined security rules and policies by users. These rules are specified at the network layer or at the application layer. Firewalls cannot provide complete protection against some attacks and intrusion (Kobayashi, 2003).They have shortcoming such as inability to prevent networks from interior attacks (Katkar, 2010). They may not be properly

configured to stop all apprehensive packets based on rules or policies due to complex and expertise of unknown traffic or emerging threats. Utilize manually configured set of rules to differentiate genuine traffic from permitted traffic. Firewalls cannot protect against attacks that bypass the rules and policies implemented. Interior system may have dial-out ability to join to an internet service providers. An internal local area network may support a modem band that provides dial-in capability for mobile employees and teleworks which pose network security threats (Gouda, 2008), (Wes Noonan, 2010), (Brian Komar, 2010) & (Sheth, 2011) and cannot protect against the transfer of malicious programs or files. Due to variety of systems softwares and applications supported inside the edge, it would be unreasonable and perhaps not viable for the firewall to scan all incoming files, e-mail, and messages for malicious activities and cannot protect against internal intruders. It does nothing to stop internal network probing or intrusion attempts from within the network. A user or staff careless or misconduct cannot be control by firewall. These firewall shortcomings pave ways, ideas, information, and further research of implementing further control alongside a firewall to detect attacks or intrusion on general networks.

Firewalls are an essential part of network security, but they do not provide airtight perimeter protection, they are not a entire security solution due to highlighted shortcomings. In order to be sure about the firewall operation installation of updated NIDSs inserted within network environs to supplement shortcomings and examine firewall operation could be viable. Network administrators can perform a more secure network system by using NIDSs as an extra layer of protection beside the firewall. Protecting information system today must be done in a layered process, which includes technology and user intervention. NIDSs have software potential of identifying illegal use, misuse and exploitation of computer by attackers and intruders (Saira Beg, 2010). NIDS are intended to identity suspicious and wicked activities that tend to compromise the confidentiality, integrity and guarantee of network computer systems (Juniper, 2008). Unlike firewall that filter “bad traffics”, NIDS analyzes packets to detect apprehensive traffic packets attempts. From the survey report CSI 2012, NIDS was ranked seventh with 62.4% (Robert, 2011) as per usage by network administrator to improved network security. The number and severity of these attacks has been increasing continuously (Indraneel, 2011). NIDSs automate examine and evaluate the attacks (Scarfone, 2010) .NIDSs are used to classify, asses and report permits network activities so that correct actions can be implemented to prevent supplementary damage (Abdelhalim, 2010).

NIDSs detection techniques join tools or a method that collect and audits the information from any number of sources, after collection it evaluate the information and determines problems existing in packets at some stage in transmission. It identifies and reports unauthorized or malicious network action. The main goals of NIDSs are to detect intrusions that have occurred or that are in the process of occurring. in attempting to understand or moderate suspicious activities (Carter, 2010).NIDS are submissive device that simply detects problems and cause alarms or alerts the security administrators. Detects the patterns of known attacks by corresponding pattern with the rule base. (It can recognize the signatures of malware programs and the types of attacks. Encryption can be severe setback for network-based NIDS because it cannot handle encrypted network traffic (Carl, 2004) & (Skrobanek, 2011). The encrypted traffic should be ignored by NIDS for high performance and to reduce false positives. NIDS decodes SSL and TLS traffic and stops inspection of the encrypted data. Only the SSL handshakes of each connection are inspected to determine that the last client-side handshake packet was not crafted to evade the

NIDS. Once the data determined to be encrypted, further inspections of the data on the connection are stopped (Toprak, 2009). Detects variation from regular actions of network systems by implementing protocol and traffic anomaly detection. It detects abnormal behavior, such as extraordinary increase in traffic from a port, time of the day and several uninterrupted ineffective attempts at logging into the computer.

Objectives, Approach and Characteristics

NIDS are proactive technique used to prevent attacks from entering the network by examining various data record and detection department of pattern gratitude sensor when an attack are identified, intrusion prevention block and log the aberrant data. Proposed framework required to provide early caveat from intrusion security violation with knowledge based. The system must be dynamic and smart in classifying and distinguish of packet data, if curious or mischievous are detected, alert triggers and event response execute. The mechanism trigger allow process packet data associated with the event. NIDS function to examine stream network traffic detecting distinguishes and recognized any packets that could be considered security breaches. The proposed methodical approach differs from previous since the concepts examining firewall operation using NIDS approach in detecting normal usages and malicious activities using diverse data which leads to improvement and enhances mechanism with combine anomaly misuse based and event parameters data input. The methodological propose improvement mechanism which uses data from sources. The parameters data input includes different structure, label, variable of data detected, collection from public DNS registry, public IP Block list, universal resource locator blacklist, NIDS snort rules, vulnerability from common vulnerability and exposures, data pattern from bastion host and DMZ, signature, dynamic update patch, Log events server, web applications, firewall and network environment, spam, IP Block list, virus definition, policies definition, event from NIDS and regular reported IP address or hosts. The basic idea of exploratory firewall operation using NIDS makes a strong system for identify, recognized and reaction from security breaches, the framework connects and related several component for perfect, intelligent, adaptive and extensible with consists of components are composite to an integrated system. The characteristics of the proposed framework consist of:-

Filtering. It involves data collection from initiating dataset formerly, after effectively pass from filtering and screening. In the process, filtering, screening and proxy with firewall function, such as IP Address, port number used, protocol used and timestamp. The propose IP tables under NIDS transmission and sorting packet with accordance to security policy set. Firewalls provide diverse rule logic with dissimilar parameters based on rule set.

Administration inform to control dataset consist of signature recognition, rules, policy, pattern, process attack, URL blacklist, renew patch, log system, listing variant of virus and normal expression, all these collected and labelled to classify attack patterns. This technique depends on the input in sequence collected in a database. The sequence in the database come from a diversity of information collected and stored periodically. In some cases, emerging attacks based on preceding patterns, particularly the attacks from malicious threat, on acquaintance process, execute composite and coalesce the data residing on the database to be sorted, queries and reused as input. The learning process occurs to unite and choose quickly by evaluating robust of the data in the database for analysis in preventing unknown attacks of intrusion.

Sensor detects the packet events found on how they are configured. If threat evaluation passes, the system triggers event reply with status alarm or risk rating status. If an alert triggers, then the alert fused with other existing alert to decrease the number of alert with the same cause. Risk level is the quantitative measure of a network's suspicious threat level before event response alleviation. When new events are detected and sensor detect an attack, an analyst can check to see if the event's regular activity components, store in archive event database if not in list. Database component gets rate mark and lists it within risk rating can deeper examination with signature corresponding and behaviour scrutiny.

The event reply are group into reactive response are trigger and implement after intrusion have been detected and proactive reply, aimed to anticipate actions to prevent an anticipated attack, By using this approach every unknown activity or doubtful threat has labelling according to NIDS rule based on priority classification which used in validating the framework based on information traced in order to make sound decisions.

Framework Main Components

The framework main components consists of firewall, two sensors NIDS, master sensor NIDS, and a LAN switch implemented within network perimeters and intersection as shown in the figure below.

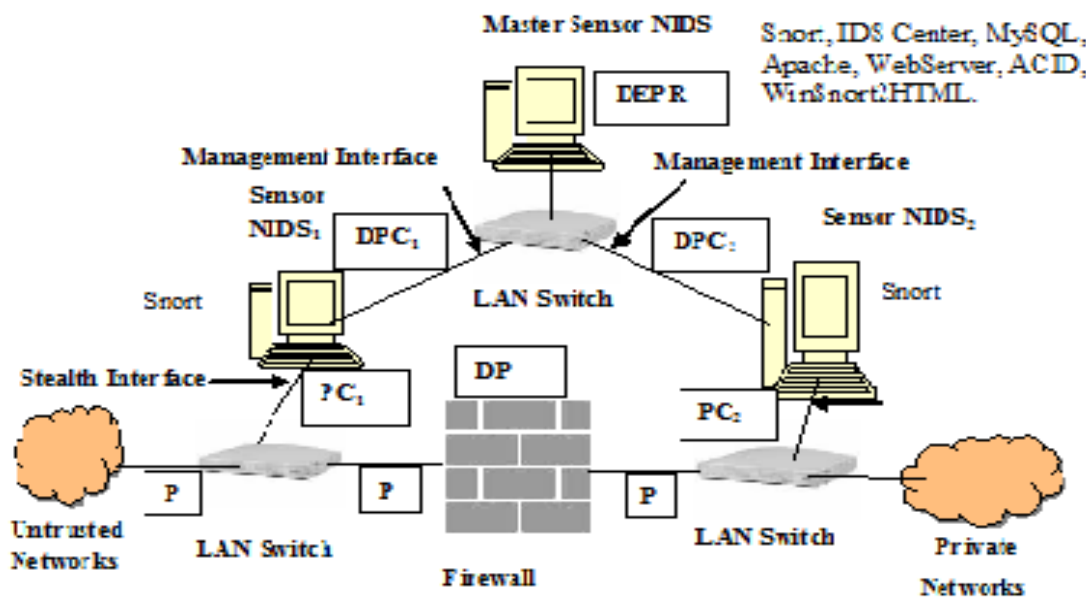


Figure 11: Framework Main Components and Network Traffic Flow Lifecycle

Packets originate from private or untrusted network. If the packet [P] originates from an untrusted network first encounters LAN switch. The packet [P] flows to the firewall where its main purposes are to filter traffic depending on the rule-set configured. If the packets are drop then the packet lifecycle ends. If the Packet has some suspicious packets the sensor NIDS₁ have the ability to detect and a packet copy [PC₁] created since the LAN switch has the capability. It is delivered through stealth interface sent detected packet copy [DPC₁] for examination and analysis according to rules and policies set in Master Sensor NIDS as detected examined packet

result [DEPR]. If the firewall allows, the detected packet [DP] encounters a second LAN switch where again a packet copy PC₂ created if any suspicion detected packet copy [DPC₂] should be sent to Master sensor NIDS for examination and analysis according to rules and policies defined in Master sensor NIDS to confirm if firewall truly enforce the configured rules and policies. It's normal packet then it passes to the private networks, the packet reaches the destination and packet ends the life cycle. If the packet originates from the private networks then similar procedure takes place as packet originating from untrusted networks.

Framework Examining Algorithm

		IF		THEN
		Sensor NIDS ₁	Sensor NIDS ₂	Check Point FIREWALL
Incoming traffic	Drop	Alert	No alert	Normal operation
		Alert	Alert	PROBLEM
	Accept	Alert	Alert	Normal operation
		Alert	No Alert	PROBLEM
Outgoing traffic	Drop	No Alert	Alert	Normal operation
		Alert	Alert	PROBLEM
	Accept	Alert	Alert	Normal operation
		No Alert	Alert	PROBLEM

Table 1: Framework Examining Algorithm

The goal of installing the sensor NIDS₁ in untrusted networks before the check point firewall and sensor NIDS₂ after the check point firewall in private networks to examine the traffic before filtration and after passing the check point firewall. The goals achieved are:-

- i. Examine if check point firewall enforces configured rules /policies of incoming and outgoing traffic;
- ii. Examining of attacks or intrusion originating from private networks and confirmation if check point firewall enforces configured rules/policies;
- iii. Examining of successful packets filtered by check point firewall from private/untrusted network;
- iv. Gives administrators room to analyse types of attacks, intrusions and adjust the security rules / policies accordingly.
- v. Adoptable as one of the source of computer, network and data communication forensic investigation.

Framework Conceptual Model

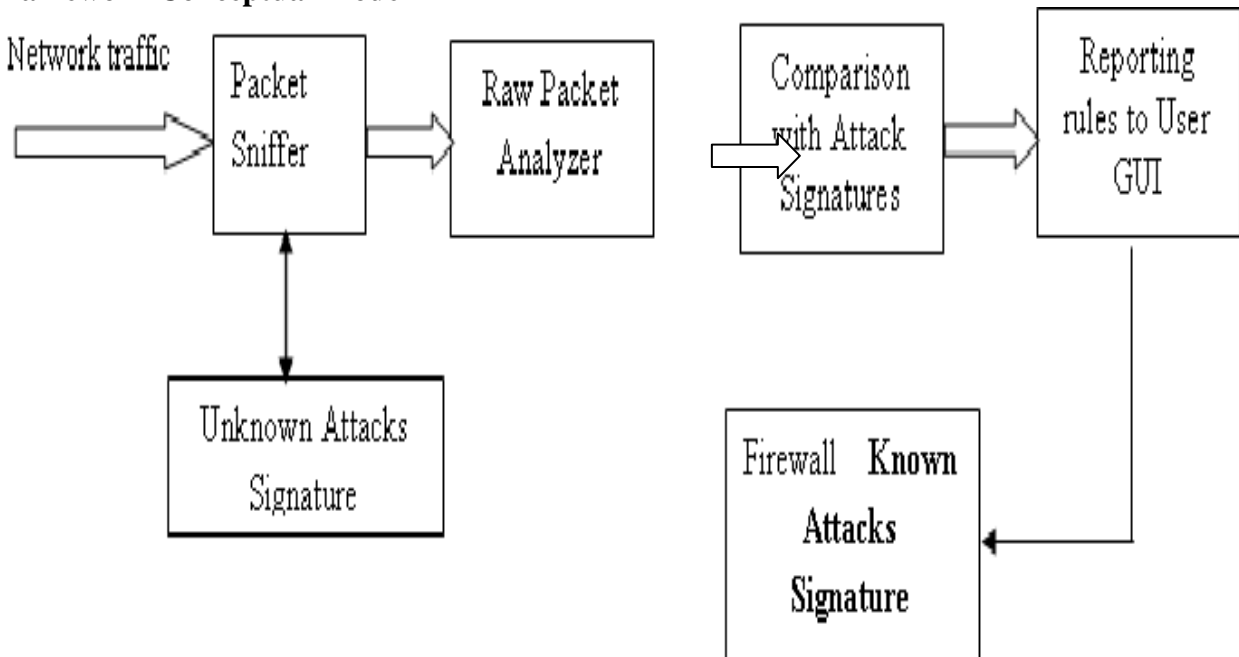


Figure 12: Framework Conceptual Model

From the figure 2 packet sniffer module captures of all incoming and outgoing network traffic. The packet sniffer installed at the edges of the network to trace all suspicious packets since it operates in promiscuous mode. In raw packet analyzer module identifies attack packet signature based on packet header of particular attack follows by identification packets details such as follows by source and destination IP address, ports, protocols, header size, Time to Live, flag bits used.

Attacks identification involves extraction of essential information traces packets details and compare with raw packet analyzer to determine module actual attack launched. Reporting attack details module involves reporting the attack to the participate for decisions making such as rules, actions events, state of network, reports and alerts. It involves The conceptual model framework for examining firewall operation using NIDS main aims at identifying unknown suspicious packets both private and untrusted network to trace the firewall rule targeted or affected informs the administrator in making sound decisions. Specification of attack details such as source victim IP addresses, time stamp of attack and type of firewall rule target.

Framework Implementation Model

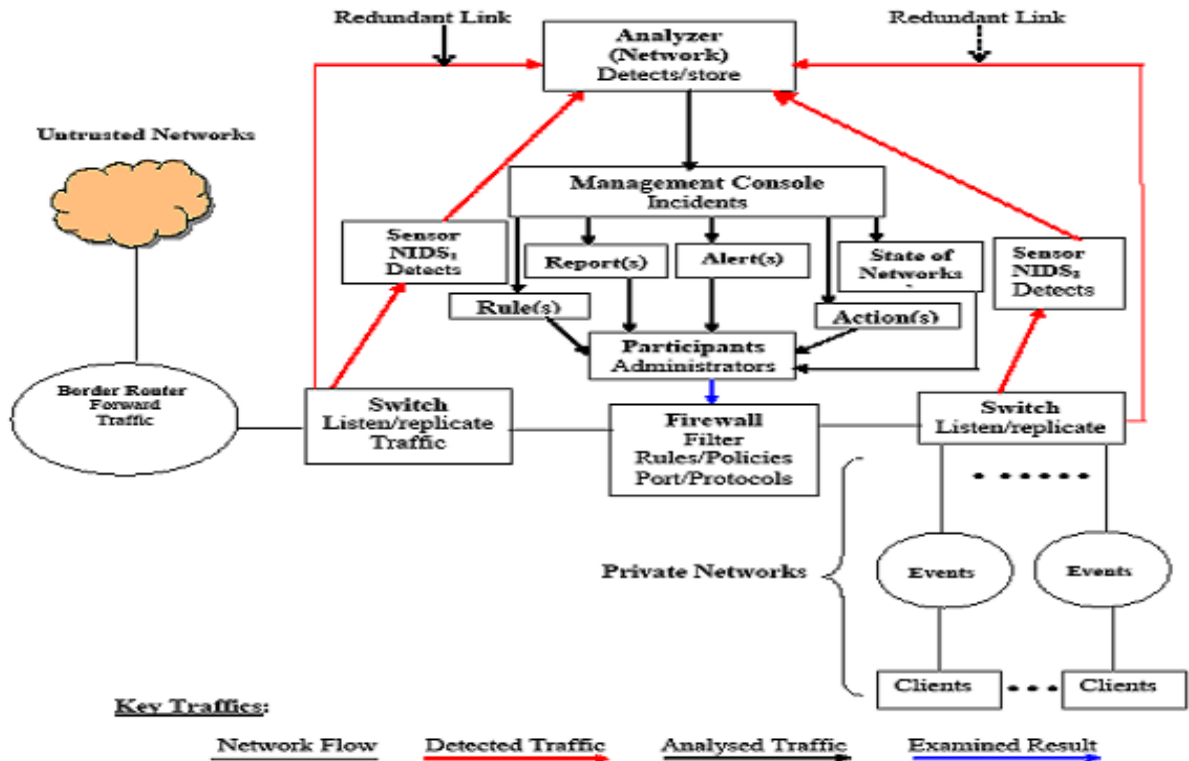


Figure 13: Framework Implementation Model

From figure 3 framework implementation model have advantages over the existing model since most of implemented models trace the packet flow only once during transit in terms of examining firewall operation between private network and firewall, untrusted network and firewall and network in general. Framework implementation model checks network traffic flows by determined by the module attributes capabilities. It involves identification of the packets definition breaking, malfunction rules/policies affected in normal operation of firewall or network in general. The module attributes play their roles based on the functionalities. The network packet first encounters the LAN switch which have listen and replicates packets on transit and pass to the firewall to filter according to rule and policies configured. The Sensor NIDSs installed at network perimeter uses in-built abilities to detect suspicious packets flows according to signatures, pattern and behaviour of the packet then packet captured pass to analyzer network determine breach rules or policies. The analyzed traffic passes to management console for identification of specific type of incidents. The participant implement the decisions according to the examined results which enables networks administrators to define, configured appropriate rules/policies to encounters firewall and network problems in general. The two redundant links supplement the link between LAN switch, Sensor NIDS and network analyzer in case link failure the link connects automatically making the examination and detection of network traffic continuously.

Framework Implementation Model Results

Most firewalls are administered by network administrator which sometimes may be complex to

examine its operation depends on the nature of network. The framework proves to examine firewall operation based on configured rules-set and detects network problems or attacks from the tests and experiment analyzed.

Absence of Internal Filtering

operations	Date	Time	From	Name	To	Name	Protocol	Detection	Details
<input type="checkbox"/> [cr][sr]	08-09-2012	16:29:03	198.168.0.191:7567	Complab	198.168.0.128:27231	1125-56	tcp	[Snort: backdoor subseven 22]	<input type="checkbox"/> Details
<input type="checkbox"/> [cr][sr]	08-09-2012	15:45:39	198.168.0.191:7567	Complab	198.168.0.128:27231	1125-56	tcp	[Snort: backdoor subseven 22]	<input type="checkbox"/> Details
<input type="checkbox"/> [cr][sr]	08-09-2012	15:05:11	198.168.0.191:7567	Complab	198.168.0.128:27231	1125-56	tcp	[Snort: backdoor subseven 22]	<input type="checkbox"/> Details
<input type="checkbox"/> [cr][sr]	08-09-2012	14:27:26	198.168.0.191:7960	Complab	198.168.0.128:20034	1125-56	tcp	[Snort: backdoor netbus pro 2.0 connection request]	<input type="checkbox"/> Details
<input type="checkbox"/> [cr][sr]	08-09-2012	14:01:46	198.168.0.191:8509	Complab	198.168.0.128:20034	1125-56	tcp	[Snort: backdoor netbus pro 2.0 connection request]	<input type="checkbox"/> Details
<input type="checkbox"/> [cr][sr]	08-09-2012	14:00:09	198.168.0.191:7960	Complab	198.168.0.128:20034	1125-56	tcp	[Snort: backdoor netbus pro 2.0 connection request]	<input type="checkbox"/> Details
<input type="checkbox"/> [cr][sr]	08-09-2012	12:03:12	198.168.0.5	Complab	198.168.0.128:27231	1125-56	icmp	[Snort: ping of death]	<input type="checkbox"/> Details
<input type="checkbox"/> [cr][sr]	08-09-2012	12:02:34	198.168.0.5:4567	Complab	198.168.0.128:12376	1125-56	tcp	[Snort: backdoor netbus getinfo]	<input type="checkbox"/> Details
<input type="checkbox"/> [cr][sr]	08-09-2012	12:02:28	198.168.0.5:4567	Complab	198.168.0.128:12376	1125-56	tcp	[Snort: backdoor netbus getinfo]	<input type="checkbox"/> Details

Figure 14: Framework Detection of Absence of Internal Filtering

From figure 4 the analyzed events reported by the framework it revealed that firewall was able to

block traffic based on configured rule set especially incoming traffic for known protocols and ports. Firewall cannot filter traffic originating from internal host to another host within the LAN which does not reach firewall interface. Framework revealed that firewall was able to act according to configured rule-sets based on known traffic but cannot filter unknown traffics and its details internally. Once a host connected to internal LAN it can send packets to any host across network without internal filtering by the firewall. Experiments were conducted to test the framework by sending traffic both physical LAN and untrusted networks such wireless. All traffic got to framework indicating that no firewall filtering for unknown traffic across network boundaries which pose networks threats and intrusion. The framework was able to detect the traffics and full packets descriptions in details which can enable network administrator to implement the necessary steps on the configuration of firewall based on framework detected reports.

Heavy Traffic on Specific Ports and Protocols

```
[*][100004:4:1] (http_inspect) BARE BYTE UNICODE ENCODING [*][Priority: 3] {TCP} 192.168.0.5:2257 ->
192.168.0.128:80
08/09-13:48:56.102377 [*][100004:4:1] (http_inspect) BARE BYTE UNICODE ENCODING [*][Priority: 3] {TCP}
192.168.0.5:2262 -> 192.168.0.128:80
08/09-13:49:12.047645 [*][100004:59:1] (snort_decoder): Top Window Scale Option found with length > 14 [*][Priority: 3]
{TCP} 192.168.0.5:33143 -> 192.168.0.128:1
08/09-13:49:12.047645 [*][1:100011:7] SCAN nmap XMAS [*][Classification: Attempted Information Leak] [Priority: 2]
{TCP} 192.168.0.5:33143 -> 192.168.0.128:1
08/09-13:49:12.047671 [*][122:1:0] (portscan) TCP Portscan [*][Priority: 3] {PROTO:255} 192.168.0.5 ->
192.168.0.128
08/09-13:49:14.347475 [*][100004:59:1] (snort_decoder): Top Window Scale Option found with length > 14 [*][Priority: 3]
{TCP} 192.168.0.5:33143 -> 192.168.0.128:1
08/09-13:49:14.347475 [*][1:100011:7] SCAN nmap XMAS [*][Classification: Attempted Information Leak] [Priority: 2]
{TCP} 192.168.0.5:33143 -> 192.168.0.128:1
08/09-13:49:15.459823 [*][100004:18:1] (http_inspect) WEBROOT DIRECTORY TRAVERSAL [*][Priority: 3] {TCP}
192.168.0.5:2277 -> 192.168.0.128:80
08/09-13:49:15.470564 [*][100004:18:1] (http_inspect) WEBROOT DIRECTORY TRAVERSAL [*][Priority: 3] {TCP}
192.168.0.5:2278 -> 192.168.0.128:80
08/09-13:49:15.481313 [*][100004:18:1] (http_inspect) WEBROOT DIRECTORY TRAVERSAL [*][Priority: 3] {TCP}
192.168.0.5:2279 -> 192.168.0.128:80
08/09-13:49:15.492053 [*][100003:18:1] (http_inspect) WEBROOT DIRECTORY TRAVERSAL [*][Priority: 3] {TCP}
192.168.0.5:2280 -> 192.168.0.128:80
08/09-13:49:16.834878 [*][1:100003:4] ICMP L3 retriever Ping [*][Classification: Attempted Information Leak] [Priority: 2]
{ICMP} 192.168.0.5 -> 192.168.0.128
08/09-13:49:16.980578 [*][1:100006:15] NETBIOS SMB IPC$ unbode share access [*][Classification: Generic Protocol
Command Decode] [Priority: 3] {TCP} 192.168.0.5:2286 -> 192.168.0.128:139
08/09-13:49:16.983118 [*][1:100006:15] NETBIOS SMB IPC$ unbode share access [*][Classification: Generic Protocol
Command Decode] [Priority: 3] {TCP} 192.168.0.5:2286 -> 192.168.0.128:139
08/09-13:49:17.006447 [*][1:100006:15] NETBIOS SMB IPC$ unloodeshare access [*][Classification: Generic Protocol
Command Decode] [Priority: 3] {TCP} 192.168.0.5:2286 -> 192.168.0.128:139
08/09-13:51:19.899482 [*][1:100006:15] NETBIOS SMB IPC$ unbode share access [*][Classification: Generic Protocol
Command Decode] [Priority: 3] {TCP} 192.168.0.5:2286 -> 192.168.0.128:139
08/09-13:51:19.912649 [*][1:100006:15] NETBIOS SMB IPC$ unbode share access [*][Classification: Generic Protocol
Command Decode] [Priority: 3] {TCP} 192.168.0.5:2286 -> 192.168.0.128:139
```

Figure 15: Heavy Traffic on Specific Ports and Protocols

From figure 5 the framework reported events with high number of regular traffic on ports 135, 137, 138, 139, 80, 23, 8080, 8180 and 445. Port 135 normally used to remotely managed service including DHCP server, DNS server detected by framework as among reported events using TCP protocol. Ports 137 used for NetBIOS-ns (name service), 138 used for NetBIOS-dgm (datagram

service) and 139 used for NetBIOS-ssn (session service) are all network services used by NetBIOS LAN hosts for communication among themselves detected by the framework as the among most examined reported traffic using TCP protocols. Ports 80 which were initial block and open for specific services specific ACK and SYN flags but the framework also detected heavy traffic on the same port. On further analysis it revealed that the port reported used flag FIN, URG and PUSH which initial was not block on firewall rule-set chain policy utilizing TCP protocol. Framework detected heavy traffic detected on port23 used for remote access using TCP specifically ICMP telnet protocol for unencrypted text communications, initial UDP protocol was block using port 23 in firewall chain policy. Ports 8080 and 8081 uses TCP protocols especially HTTP alternate (HTTP_alt). Port 8080 commonly used by Web proxy and caching, APACHE servers was also detected by framework as among heavy traffic examined events among port not initially configured on the firewall chain rule policy. This implies that the framework was able to detect and report the port and classifies the type of protocol used and other packet details. Port 445 using TCP protocols which used Server Message Block (SMB) and Inter Process Communication (\$IPC) for files sharing on Microsoft active directory. This was detected by framework as among the port with heavy traffic examined events reported. All these ports and protocols provide essential information about the status of the hosts within the network. This information could be used to map network services and launch network attacks or intrusion if firewall rule sets and policies are not fully implemented and operational as expected.

Suspicious Packets and Internal IP Addresses

Network Intrusion Detection System Management Console									
Latest Events								Active clients	
Examine Events	Date	Time	From	Name	To	Name	Protocol	Detection	1125-56, 192.168.0.191
System Management	08-09-2012	13:45:09	192.168.0.191:5196	Complab	192.168.0.128:5196	1125-56	udp	[snort: bad traffic non standard protocols]	
Client Management	08-09-2012	13:45:09	192.168.0.191:5199	Complab	192.168.0.128:6170	1125-56	udp	[snort: bad traffic non standard protocols]	
Report Management	08-09-2012	13:45:09	192.168.0.191:6012	Complab	192.168.0.128:6177	1125-56	tcp	Unsolicited traffic	
Account Management	08-09-2012	13:45:09	192.168.0.191:6045	Complab	192.168.0.128:7103	1125-56	tcp	Unsolicited traffic	

Figure 16: Suspicious Packets and Internal IP Addresses

From figure 6 the tested results from the framework traced numerous suspicious packets and internal IP address which firewall could not filter especially for network which are not centrally managed, where IP addresses are not assigned dynamically specific ports and protocols could be

filtered. The framework detected bad traffic non- standard IP protocols, unsolicited connection mostly using TCP using port 445 and UDP using port 111 respectively were the most reported suspicious packets with specific hosts IP addresses source names and their destinations. Other detected packets and logged events revealed evidence by the framework was mis-configured software and hosts on the network. These two ports detected as bad traffic non standard IP protocol which portmapper to access network services both internally and externally due undetected traffic by firewall. After resetting the firewall rule set then the firewall filtered the traffic

Suspicious Foreign Packets and IP Addresses

Network Intrusion Detection System Management Console								
Latest Events								Active clients
Examine Events		Time	From	Name	To	Name	Protocol	Detection
System Management	10-08-2012	10:07:21	216.185.152.150:80	216.185.152.150 www.kca.ac.ke	192.168.0.128:1024	1125-56	tcp	Unsolicited traffic
Client Management	08-09-2012	13:45:09	41.204.161.16.443	41.204.161.16.443 www.kabianga.ac.ke	192.168.0.128:2081	1125-56	tcp	Unsolicited traffic
Report Management	13-09-2012	13:45:09	41.204.161.16.443	41.204.161.16.443 www.kabianga.ac.ke	192.168.0.128:17441	1125-56	tcp	Unsolicited traffic
account Management	14-09-2012	13:45:09	41.204.161.16.1428	41.204.161.16.443 www.kabianga.ac.ke	192.168.0.128:2001	1125-56	tcp	Unsolicited traffic
Log Out	17-09-2012	16:00:21	196.43.133.84:4426	196.43.133.84:4426 www.mak.ac.ug	192.168.0.128:1434	1125-56	udp	[Snort::SQL Vulnerability Propagations]
Administrator	17-09-2012	16:02:45	196.43.133.84:1116	196.43.133.84:4426 www.mak.ac.ug	192.168.0.128:1434	1125-56	udp	[snort::SQL Vulnerability propagations]
Current Users:1								
Events Today:6								

Figure 17: Suspicious Foreign Packets and IP Addresses

From figure 7 the framework detected suspicious foreign packets and IP addresses even with the installation of firewall expected to provide high degree of protection. After testing the framework using internal network foreign IP address, the IP address was delivery to the destination and the framework could detect these suspicious foreign and IP address. This indicates that the firewall was mis-configured since the number and frequency of packets on the network from foreign IP addresses and the times at which they were highly reported by the framework. Although some of the packets were drop but the fact that some packets were detected by the framework which indeed reveals a significant firewall security flaws. The framework detected TCP or UDP packets originating from untrusted network and submitted to port 1434 which were propagated by the vulnerabilities in Microsoft SQL server database management system which could launch a denial of service attacks against internet hosts and show slow down network speed by engaging the bandwidth. Many suspicious source address report by framework associated with attempting to connect to port 1024, a port that if often used by backdoor application which includes Netspy, port 10000 which host Webmin and port 161 which is associated with SNMP services.

Conclusions and Recommendation

With new emerging network threats and mostly firewall are normally configured manually they cannot be examined to critically review normally operation which leads to the option of developing a framework to examine firewall operation and network in general. Since there exist programs which have capability to detected and examine every packet flow within network setup they can utilized and implemended to examine firewall operation. This detected software includes NIDS specifically snort software which is open source having mechanism to inspect packet signature patterns and behaviours patterns. It can be utilized within network perimeters purposely to examine firewall operation and network in generally.

Firewall as network component vital in connecting two homogeneous networks. The operation of firewall has not been clearly examined to check its operation. These lead to conceptual of developing a framework which purposed installed within network environment to examined firewall operation. The framework can be adaptable since it functions on real time, which implies that it is active, persistent and careful consideration of any detected network anomalies based on framework information which forms foundation of knowledge in the light of detection grounds that support firewall and network weaknesses before making conclusion. The aim of the framework is to examine firewall and explores an issue of concern, a triggered detected packet which breaches network security policies configured in the firewall and engage to explore an order which lead to new understanding and appreciation information before implementing corrective measure.

Firewall and other networks protection systems do not see packets patterns nor do they report on events that do break their rules where attacks and intruders may that advantage to exploit the network services without being noticed. The proposed framework can provide extended information on possible incidents management where administrator and users can use in providing defense in depth analysis of firewall operation and current network security status. Firewall do not see what happen within themselves where approve request are not saved or traced. Pattern attacks are detected by the framework instantly and problems of firewall as well. Generated events and reports provides a solid base for any network incident, valuable information directly from the source, long run or incidental problems as well which enable network administrator to analysis and make sound decision based on reported events.

By setting up framework according to rules and policies deviation are reported automatically where administrator can check the events examined or audit to check if the firewall is compliant according to configured rules or policies where some are complex and high-level. The reported events enable the administrator to enforce and implement the appropriate rule which make the network safer to use. The framework application as integrated part of the network information technology landscapes any new application or internet both from internal or untrusted networks is check from day one instantly.

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