THE ROLE OF DESIGN IN DEVELOPING EXHIBITION AND DISPLAY FOR MUSEUMS IN KENYA

GRACE NJERI GATERE

B51/64073/2010

SUPERVISOR

DR. SAMUEL M. MAINA

THIS THESIS IS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTER OF ARTS DEGREE IN DESIGN

SCHOOL OF THE ARTS AND DESIGN

UNIVERSITY OF NAIROBI

JUNE 2014
DECLARATION

This thesis is my original work and has not been presented for award of any degree in any University.

Signature---------------------------- Date-------------------

Grace Njeri Gatere
B51/64073/2010

This thesis has been submitted for examination with my approval as University of Nairobi Supervisor.

Signature---------------------------- Date-------------------

Dr. Samuel M. Maina
School of The Arts and Design
University of Nairobi
DEDICATION

To my grandparents; Grace Njeri Gatere and David Gatere for educating me in more ways than they realize even when the obstacles seemed insurmountable. *You awakened in me a passion for excellence and a taste for the impossible. You sowed in me a marvelous seed: ‘quest for higher education’. 
ACKNOWLEDGEMENT

I am grateful to my supervisor Dr. Samuel M. Maina for his intellectual support and mentoring.

On a personal note, my heartfelt gratitude goes out to my friends and family whose love and support helped me to reach this day. In a special way, I thank my husband Jezreel for being patient in the course of my studies. Gratefulness to my great college colleagues who showed me what it means to care for a friend in need. To Dr. Samson Ayugi of Technical University of Kenya; thank you so much for acting as a second supervisor. Thank you for reading every single draft that I wrote, for the corrections and for guidance.

Finally, I would like to express my sincere gratitude to my dear mother Agnes Gatere who has been my rock every step of the way. Words can’t fully express what her support has meant to me. She encouraged me to make a move into further studies and you went ahead to support me financially, emotionally and spiritually. My little son, Nathan Mwalaghe who had to endure my absence during his formative years in life should just know that mummy loves him very much.
ABSTRACT
Museum exhibition is essentially a form of visual communication. It achieves this through the museum objects and works of art, aided by the use of graphics and written information in the form of text panels, captions and individual object labels. The ultimate intention should be to communicate the message of the display or exhibition in a clear and precise visual and written language. Such language should be easy to understand at whatever level or levels of interpretation, just as in a good newspaper or magazine. The purpose of this study is to establish whether the current display of artefacts in museum exhibitions is ideal for learning. The study focuses on labeling, circulation and display considerations in museums. The methodology takes the particular form of a case study. The target population of this study was visitors in the two museums, exhibition designers and curators. The findings point out that two obvious factors in capturing attention are the salience or distinctiveness of the label and the traffic flow patterns in the environment. The two factors in this thesis determine the possibility of interaction between visitors, exhibits and display. Thus design does have a crucial role to play in developing museums in Kenya.
Acronyms

FGD’s: Focus Group Discussions

NMK: National Museums’ of Kenya
# Table of Contents

DECLARATION .................................................................................................................. ii  
DEDICATION .................................................................................................................. iii  
ACKNOWLEDGEMENT .................................................................................................... iv  
ABSTRACT ......................................................................................................................... v  
Acronyms ......................................................................................................................... vi  
Table of Contents ............................................................................................................. vii  
LIST OF TABLES ................................................................................................................ x  
TABLE OF FIGURES .......................................................................................................... xi  

CHAPTER ONE ................................................................................................................ 1  
INTRODUCTION ................................................................................................................ 1  
1.1 Background to study ................................................................................................. 1  
1.2 Problem Statement .................................................................................................... 3  
1.3 Aim and objectives .................................................................................................... 4  
1.4 Research Questions ................................................................................................... 4  
1.5 Significance of the Study .......................................................................................... 4  
1.6 Scope .......................................................................................................................... 5  

CHAPTER TWO ............................................................................................................... 8  
LITERATURE REVIEW ..................................................................................................... 8  
2.1 Introduction ................................................................................................................ 8  
2.2 Historical background on museums .......................................................................... 8  
2.2.1 Background on Kenyan Museums ......................................................................... 9  
2.2.1.1 Museum exhibition considerations by other writers ....................................... 10  
2.3 Learning ..................................................................................................................... 11  
2.3.1 Theories informing museum education and learning ............................................. 11  
2.3.2 Signage and Museum Learning ............................................................................. 19  
2.4 Techniques of display of items .................................................................................. 20  
2.5 Empirical studies ...................................................................................................... 21  
2.5.1 Signage and text considerations .......................................................................... 21  
2.5.2 Circulation patterns considerations ...................................................................... 26  
2.5.3 Museum Design and Circulation .......................................................................... 28  
2.6 Design approaches to exhibit design ......................................................................... 29  
2.6.1 Design Approaches That Employ Realism ........................................................... 30  
2.6.2 The Hands-On Approach ..................................................................................... 32  
2.6.3 The Social Facilitation Approach ........................................................................ 33  
2.6.4 The Individual-Difference Approach ................................................................... 35  
2.6.4.1 Cognitive Ability .............................................................................................. 35  
2.6.4.2 Learning Style .................................................................................................. 35  
2.6.4.3 Interest Levels .................................................................................................. 36  
2.6.4.4 Demographic Characteristics .......................................................................... 36  
2.5 Conceptual Framework ............................................................................................. 36  

CHAPTER THREE ......................................................................................................... 38  
RESEARCH METHODOLOGY ......................................................................................... 38  
3.1 Introduction ................................................................................................................. 38
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2 Research Design</td>
<td>38</td>
</tr>
<tr>
<td>3.3 Population</td>
<td>41</td>
</tr>
<tr>
<td>3.4 Sampling Procedure and Sample Size</td>
<td>41</td>
</tr>
<tr>
<td>3.5 Data Collection method</td>
<td>42</td>
</tr>
<tr>
<td>3.6 Data Collection tools</td>
<td>43</td>
</tr>
<tr>
<td>3.7 Data Analysis</td>
<td>43</td>
</tr>
<tr>
<td>3.7.1 Pilot study</td>
<td>44</td>
</tr>
<tr>
<td>3.7.2 Reporting the results</td>
<td>44</td>
</tr>
<tr>
<td>3.8 Summary</td>
<td>45</td>
</tr>
<tr>
<td>CHAPTER FOUR</td>
<td>46</td>
</tr>
<tr>
<td>DATA PRESENTATION AND ANALYSIS</td>
<td>46</td>
</tr>
<tr>
<td>4.1 Introduction</td>
<td>46</td>
</tr>
<tr>
<td>4.2 Response Rate</td>
<td>46</td>
</tr>
<tr>
<td>4.3 Personal Information</td>
<td>47</td>
</tr>
<tr>
<td>4.3.1 Level of Formal Education</td>
<td>47</td>
</tr>
<tr>
<td>4.3.2 Age</td>
<td>48</td>
</tr>
<tr>
<td>4.3.4 Residence of visitors</td>
<td>49</td>
</tr>
<tr>
<td>4.3.5 Reason for visiting the museums</td>
<td>50</td>
</tr>
<tr>
<td>4.4 Signage and text considerations</td>
<td>50</td>
</tr>
<tr>
<td>4.4.1 Legibility and readability</td>
<td>51</td>
</tr>
<tr>
<td>4.4.2 Comprehension</td>
<td>53</td>
</tr>
<tr>
<td>4.4.3 Adequacy of information in paragraphs</td>
<td>53</td>
</tr>
<tr>
<td>4.4.4 Did you learn more from the objects, labels or guide?</td>
<td>54</td>
</tr>
<tr>
<td>4.5 What they learnt</td>
<td>55</td>
</tr>
<tr>
<td>4.6 Circulation consideration</td>
<td>56</td>
</tr>
<tr>
<td>4.6.1 Circulation patterns (plans showing patterns)</td>
<td>56</td>
</tr>
<tr>
<td>4.6.2 Circulation Paths</td>
<td>57</td>
</tr>
<tr>
<td>4.7 Display of items</td>
<td>59</td>
</tr>
<tr>
<td>4.7.1 What was appealing in the museum</td>
<td>60</td>
</tr>
<tr>
<td>4.8 Suggestions</td>
<td>61</td>
</tr>
<tr>
<td>CHAPTER FIVE</td>
<td>63</td>
</tr>
<tr>
<td>INTERPRETATION OF THE FINDINGS</td>
<td>63</td>
</tr>
<tr>
<td>5.1 Introduction</td>
<td>63</td>
</tr>
<tr>
<td>5.2 Interpretation of the findings</td>
<td>63</td>
</tr>
<tr>
<td>5.3 Summary</td>
<td>66</td>
</tr>
<tr>
<td>CHAPTER SIX</td>
<td>67</td>
</tr>
<tr>
<td>SUMMARY OF THE FINDINGS, RECOMMENDATIONS AND CONCLUSIONS</td>
<td>67</td>
</tr>
<tr>
<td>6.1 Introduction</td>
<td>67</td>
</tr>
<tr>
<td>6.2 Summary</td>
<td>67</td>
</tr>
<tr>
<td>6.3 Recommendations</td>
<td>68</td>
</tr>
<tr>
<td>6.3.1 Signage and text</td>
<td>68</td>
</tr>
<tr>
<td>6.3.2 Circulation considerations</td>
<td>69</td>
</tr>
<tr>
<td>6.3.3 Display considerations</td>
<td>69</td>
</tr>
<tr>
<td>6.4 Conclusion</td>
<td>70</td>
</tr>
<tr>
<td>6.4.1 The role of circulation and display in developing museums</td>
<td>70</td>
</tr>
<tr>
<td>6.4.2 The role of labeling in developing museums</td>
<td>70</td>
</tr>
</tbody>
</table>
6.4.3 Proposed attributes that may enhance learning ........................................ 71
6.5 Suggestions for further research ............................................................... 71
REFERENCES .............................................................................................. 73
APPENDIX I ................................................................................................. 90
APPENDIX II ............................................................................................... 91
APPENDIX III ............................................................................................... 92
APPENDIX IV ............................................................................................... 95
LIST OF TABLES

Table 3-2-0-2 Visitor statistics........................................................................................................... 40
Table 3.4-0-1 Sample size.................................................................................................................. 42
Table 4-0-1.1: Reasons for museum visits......................................................................................... 50
Table 4-0-1.6 Time spent vs. learning .............................................................................................. 56
Table 4.7-0-1 Reasons for dislike of display .................................................................................... 60
Table 4.7-0-2 The most memorable and appealing things.............................................................. 60
Table 4.8-1 Suggestions by respondents......................................................................................... 61
TABLE OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Map of Kenya</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Fort Jésus Muséum location</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>Narok National Museum Location</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>The contextual model of learning</td>
<td>18</td>
</tr>
<tr>
<td>5</td>
<td>“Museum of Unlimited Growth”</td>
<td>29</td>
</tr>
<tr>
<td>6</td>
<td>Conceptual framework</td>
<td>37</td>
</tr>
<tr>
<td>7</td>
<td>Research design showing the data collection methods and analysis</td>
<td>39</td>
</tr>
<tr>
<td>8</td>
<td>Response rate</td>
<td>47</td>
</tr>
<tr>
<td>9</td>
<td>Showing level of education</td>
<td>48</td>
</tr>
<tr>
<td>10</td>
<td>Showing the age of respondents interviewed</td>
<td>49</td>
</tr>
<tr>
<td>11</td>
<td>Respondents by country of residence</td>
<td>49</td>
</tr>
<tr>
<td>12</td>
<td>Did the respondent read all the labels?</td>
<td>52</td>
</tr>
<tr>
<td>13</td>
<td>Respondents readability</td>
<td>52</td>
</tr>
<tr>
<td>14</td>
<td>Shows words that could not be understood</td>
<td>53</td>
</tr>
<tr>
<td>15</td>
<td>Were the paragraphs used for the labels adequate?</td>
<td>54</td>
</tr>
<tr>
<td>16</td>
<td>Did you learn more from the objects, labels or guide?</td>
<td>55</td>
</tr>
<tr>
<td>17</td>
<td>Circulation patterns chosen by museum visitors</td>
<td>57</td>
</tr>
<tr>
<td>18</td>
<td>Arrows showing the different patterns followed</td>
<td>57</td>
</tr>
<tr>
<td>19</td>
<td>Circulation paths within the museums</td>
<td>58</td>
</tr>
<tr>
<td>20</td>
<td>Circulation paths within Fort Jesus museum</td>
<td>58</td>
</tr>
<tr>
<td>21</td>
<td>showing respondents like or dislike of the display</td>
<td>59</td>
</tr>
<tr>
<td>22</td>
<td>Visitors with different agenda at Fort Jesus Museum</td>
<td>95</td>
</tr>
<tr>
<td>23</td>
<td>Stamps as an exhibit at Fort Jesus Museum</td>
<td>95</td>
</tr>
<tr>
<td>24</td>
<td>The diver in Fort Jesus Museum</td>
<td>96</td>
</tr>
<tr>
<td>25</td>
<td>Visitors with a tour guide following a chronological path</td>
<td>96</td>
</tr>
<tr>
<td>26</td>
<td>Display of china ware at Fort Jesus Museum</td>
<td>97</td>
</tr>
<tr>
<td>27</td>
<td>Labeling of items in Fort Jesus Museum</td>
<td>97</td>
</tr>
<tr>
<td>28</td>
<td>Fort Jesus Museum circulation paths taken by different visitors</td>
<td>98</td>
</tr>
<tr>
<td>29</td>
<td>Visitors walking in and turning left in Fort Jesus Museum</td>
<td>98</td>
</tr>
</tbody>
</table>
Figure 30 Gourds that were used for preservation by the Maa................................. 99
Figure 31 Visitors looking at different items in Narok Museum .................................. 99
Figure 32 Paintings on walls of Narok Museum .......................................................... 100
Figure 33 Spears that the Maasai would place outside .................................................. 100
Figure 34 Manyatta and mural on the wall in Narok Museum........................................ 100
Figure 35 Narok Museum vitrine placed near a window.................................................. 101
Figure 36 Narok Museum showing arrangement of cabinet............................................. 101
A unique attribute of museum exhibitions is that visitors are present in them. The public displays and exhibitions are the museum’s most important means of communication. Its potential and capacity for communication is therefore the major issue to keep in mind when planning and designing an exhibition, whatever the theme, mode or type. A good designer will seek to enhance communication by creating attractive displays that place the emphasis on the desired highlights in terms of the objectives of the exhibition, often by drawing on experience from theatre illumination techniques. The aim of the exhibition throughout must be to motivate the visitor and enhance curiosity. This thesis is divided into six chapters. Chapter one covers the background to the study, research objectives and questions, the significance of study and the scope. Chapter two reviews literature on the subject. The methodology applied in the study is discussed in chapter three. Data analysis and presentation is provided in chapter four. Chapter five presents the interpretation of analyzed data. Finally chapter six summarizes the findings, the conclusions and gives recommendations.

1.1 Background to study

Museums are categorized as: natural history, cultural history, science and space, train, zoo and art museums. From observation, Kenyan museums are essentially about Kenyan cultural history. The role of cultural history museums is connected to transferring experiences from history and other cultures to the present time and place (Turpeinen, 2006). Turpeinen adds that cultural history museums are by nature a complex historical institution, which requires examination from the context of various fields. Kenya has various cultural history museums in different parts of the country. This thesis is a comparative study of the exhibition and display design of two museums in Kenya and their influence on visitor’s learning. The two museums are Fort Jesus and Narok.

Museums- the very mention of the word evokes one's memories about past experiences (Waltl, 2006). Museum visitors learn the story that a museum curator wishes to tell
through exhibition and display design. This is done by taking the objects, images, and information provided and arranging and presenting them in a way that protects the objects while easily communicating the story to museum visitors. Exhibition and display design in this thesis entails the creative process involved in planning how to show items for the purpose of communication. The starting point for exhibition design is always the time period in which the designer is found when designing (Velarde, 2001). In this thesis, design is expressed as a means of exercising creativity.

Turpeinen (2006) explains that the role design should play in museums is to reveal not to conceal the content, to enhance and not to overwhelm it and to create a stage for its performance. The ability to interpret and understand information is related to the design of the content. The various attributes of display design uncovered by research are layout/movement, the color codes, lighting, artefacts placement, materials, signage, and the type and font used for label design. These elements can be manipulated in museum exhibition to form interesting displays for creativity. The thesis focused on two elements; layout/movement, and label design because these two form part of the basic elements of designing an exhibition (Bitgood, 2003).

Museums use labels to guide visitors through exhibits in the way that delivers the lesson or meaning intended by the curator (Simon, 2010). The labels stand to the object in a relationship of a different kind, not descriptive but an explanatory relation (Greenblatt, 1991). Greenblatt adds that a label denotes the elements of naming, information and exposition the exhibitor makes available to the viewer in whatever form, a label is not just a piece of card but includes the briefing given on the catalogue entry and even lighting that aims to make a point. Texts introduced stand in for the context that has been effaced in the process of moving the object into the museum. Kenyan museums, from observation seem to forget the fact that the displayed objects have a story behind them. They avoid effective labeling techniques to explain the story behind the artefacts.

Museums consideration of movement defines layout and it encompasses the organization of viewing spaces in a sequence, a principle intrinsic to museum design and instrumental for the accommodation of visitors’ (Simon, 2010). Unfortunately, the consistency of movement patterns is not readily apparent. How visitors circulate through museums
determines what visitors will see, where they focus their attention, and, ultimately, what they learn and/or experience (Bitgood, 2006).

Much of today's focus on education is on formal resources like schools and classrooms. Informal settings such as museums offer untapped potential for communicating social, cultural and scientific information (Gammon, 2003). Learning in public environments such as museums is largely voluntary and self-directed. Usually, exhibition experiences are without benefit of teachers or other knowledgeable persons to interpret what visitors are seeing or doing. This means that visitors may or may not learn and that they have misconceptions. It is imperative that museum exhibitions make latent meaning of objects shown professed through display design (Screven, 1993).

Research has shown consistent findings on how museum displays can aid learning to the diverse audiences that visit them. Even if the audience doesn’t recognize that learning is taking place, and even if the intended meaning is misinterpreted, most researchers agree that there is an opportunity to achieve the desired result (intended meaning learned by all the visitors) even if a universal way of designing displays is not known (Allen, 2004b).

To date there has been no documentation of effective label design and circulation consideration in most of the Kenyan museums. Thus it is not possible to quantify whether learning is being enhanced, hence this study.

Considerations for display design will be a study of two Kenyan museums namely Fort Jesus and Narok. Fort Jesus was declared a world heritage site in 2011 and is in a highly touristic region of the country. From observation Narok Museum boasts the rich Maa culture artefacts yet it is a very small museum with very low visitor turn out.

1.2 Problem Statement

Bitgood (1993) in his research of visitor movement, behavior and learning confirmed that visitors navigated the Museum’s exhibition as intended but little was actually learnt from the experience. Visitors learnt little because their attention was random as they were easily distracted. They did not look at provided information; much of their attention focused on trivial elements. As stated in section 1.1 the literature review has not
unearthed any study indicating how much learning takes place in Kenyan museums, thus the need for this study.

1.3 Aim and objectives
The overall goal of this study was to establish whether the current display of artefacts in museum exhibitions is ideal for learning.

The specific objectives were to:

i. Determine whether artefacts are correctly displayed

ii. Analyse labeling applied in museums

iii. Propose appropriate exhibition and display design attributes that may enhance learning in museums

1.4 Research Questions
This study aimed to respond to the following questions:

i. What are the considerations for display design in the two museums?

ii. Is the display of artefacts ideal for learning?

iii. How are artefacts displayed in relation to circulation?

iv. Is the current labeling in museum appropriate?

v. What is the best system for designing exhibition and display for museums?

1.5 Significance of the Study
The study will assist curators in telling the objects story while considering the effects of proper design of the whole museum environment. The exhibition designers will also benefit in the fact that they will use the findings to identify appropriate label design methods and proper overall layout for the museum. Museum visitors will easily access and understand the artefacts. The research findings will also add to the extant knowledge in exhibition and display design of artefacts.
1.6 Scope
The scope of this study contains two tenets; thematic and geographical.

The thematic scope of this study confines itself to exhibition and display of artefacts in a museum from a designers’ perspective

The geographic scope of the study confines itself to the study of two museums namely Narok National Museum found in Narok Town, Narok County, and Fort Jesus Museum found in Mombasa town, Mombasa County, Kenya.

Figure 1 Map of Kenya (Google Maps 29/10/2012). The figure shows Mombasa town while the purple mark shows the location of Narok town.
The figures below show the locations of the both Fort Jesus and Narok Museums in their various counties in Kenya.

Figure 2 Fort Jésus Muséum location (Google Maps, 26/09/2012)

Figure 3 Narok National Museum Location (Google Maps, 26/09/2012)
Definition of terms

**Display:** To put something in a place where people will see it, where it will attract attention.

**Label:** Denotes the elements of naming, information and exposition the exhibitor makes available to the viewer in whatever form. A label is not only a piece of card but includes the briefing given on the catalogue entry and even lighting that aims to make a point. Labels will thus act as informational signs to give information about the visual content of exhibits.

**Learning:** learning in museums is defined as the meaning making process which is achieved through negotiation and interaction between visitors and tools. More dynamic and multiple modes such as gesture, talking, and action for using tools in a museum is emphasized for an understanding of how people learn in museums (Rahm, 2002).

**Texts:** Refer to the context that has been effaced in the process of moving the object into the museum.

**Signage:** Refers to instructional signs which tell visitors what to do, what to look for, or what to compare.
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction
This chapter starts with a historical background on museums and their role. It is followed by considerations that the National Museums of Kenya had when establishing the two museums. It also reviews the different schools of thought of other museum writers on Museums exhibition. It proceeds to highlight the different techniques of displaying items around the world. It looks at empirical studies on signage text and circulation patterns considerations. It subsequently concludes with conceptual framework drawn to show the interrelationship of the variables.

2.2 Historical background on museums
According to Oyieke (2012), Kenya has twenty nine Museums, monuments and sites examples of which are listed as Wajir, Karen Blixen, Lamu, Malindi, Fort Jesus, Kitale, Desert Museum, Kapenguria, Nairobi National, Nairobi Gallery and Narok are examples of museums while Hyrax Hill, Gede Ruins are examples of historical sites all located in different counties within Kenya. They were established by an Act of Parliament to consolidate the law relating to national museums and heritage; to provide for the establishment control, management and development of national museums and the identification, protection, conservation and transmission of the cultural and natural heritage of Kenya; to repeal the Antiquities and Monuments Act and the National Museums Act; and for connected purposes.

The earliest museums were founded on the premise of 'education for the uneducated masses' (Bennett, 1995), 'cabinets of curiosities' established to '... raise the level of public understanding ... to elevate the spirit of its visitors ... to refine and uplift the common taste' (Weil, 1997). Current museum discourse has identified the need for a conceptual change from museums as places of education to places for learning, responding to the needs and interests of those who visit and use their services (Bradburne, 1998).
International Council of Museums (ICOM) (2007) provides the definition of a museum as: “A non-profit making, permanent institution in the service of society and of its development, and open to the public, which acquires, conserves, researches, communicates and exhibits, for purposes of study, education and enjoyment, material evidence of people and their environment.” This definition shows why museums are created.

In classical times museums signified a temple dedicated to the Muses, those nine sprightly and pleasantly amoral young goddesses who watched over the welfare of the epic, music, love poetry, oratory, history, tragedy, comedy, the dance, and astronomy (Alexander, 1979). Collections were known by two terms; one type of collection was identified as a cabinet, usually a square room filled with taxidermic animals, botanical rarities, some works of art, and historical objects. The second type of collection was identified as a gallery, usually a long hall, side lit, filled with paintings and sculptures (Medved, 1998).

There are several kinds of museums: natural history, historic, science and space, train, zoo and art museums (Bitgood, 2006). In Kenya, the museums are in essence historic though some museums have temporary art collections being exhibited. Historic museums are usually housed in historical buildings to preserve the heritage of their town. Typical historic museums boast exhibits and collections featuring agricultural artefacts, antiques, documents and memorabilia which specifically related to the history of the region they are located in.

2.2.1 Background on Kenyan Museums

a) Fort Jesus

The site lies a distance of about 490-km from Nairobi County. The Museum is located across the gate of the Fort. The collection consists largely of ceramics: Chinese porcelain, Persian and Portuguese glazed ware and local and foreign earthenware excavated at Swahili sites on the coast or acquired in Mombasa. The display cases are in chronological order, and the labels are colored according to the origin of the exhibits: Buff - African;
Yellow - Chinese; Green - Islamic; Blue - Indian; Red - European. The white labels provide a continuous narrative linking the cases with each other.

b) Narok Museum

The Narok/Maa museum is located in a west-north-west direction 141km from Nairobi at the entrance of Narok town. The museum, opened to the public in 1996, is housed in a building that previously served as a community hall now converted into an office, a collection room and an exhibition gallery. The pictures and artefacts displayed at the museum serve to preserve the traditional culture of the Maasai and other Maa language speakers i.e. the Samburu of Samburu and Laikipia districts, Njemps of Baringo district and groups of the Ndorobo neighboring the Maasai of Narok and Kajiado districts.

2.2.1.1 Museum exhibition considerations by other writers

Baxandall (1991) describes a museum exhibition as traditional, in that it consists of the display of objects for examination. The objects are presented in vitrines, on stands, or on walls and are accompanied by labels leaflets or a catalogue. There may be additional elements –video displays of films, theatrical or musical performances, perhaps even cuisine- but the center of the exhibition consists of objects offered for inspection and to some extent expounded.

According to Nina (2010), in a traditional museum photo exhibition, visitors can look at photographs hanging on the walls. They can read information about each photo and its creator in label text, and they can probably access information about how the photograph is catalogued in the museum’s collection database. Sometimes visitors may take their own pictures of the photographs; other times, they are prohibited from capturing any likeness of the artifacts or even their labels. In some installations, visitors may be able to share personal thoughts about the photographs in a comment book at the entrance or exit to the gallery.

From history museums exhibitions have always been seen as places that can make a difference in society through education and learning. The museums of Kenya can thus not afford to be boring and lose the attention of the people to other leisure spots.
2.3 Learning

Designing a museum exhibition is becoming a complex process that requires a multitude of decisions to ensure a smooth progression after establishing the client’s needs (Lin, 2003). One of the needs of a client in a museum is learning. Museums present different contexts for learning, they are visited by a broad range of people and are often described as free-choice learning environments (Falk & Dierking, 2000). Senge (1992) explains that “real learning gets to the heart of what it means to be human”. Informal settings such as museums offer untapped potential for communicating social, cultural and scientific information, correcting misconceptions and improving attitudes and cognitive skills (Gammon, 2003).

Since informal learning is key in public environments, museum owners should take into consideration attributes of display designs that enhance leaning. For the purposes of this thesis the attributes will be label design and layout.

2.3.1 Theories informing museum education and learning

The practice of education in museums has a long history (Hein, 1998; Hooper-Greenhill, 1994; Roberts, 1997). Whichever theory was fore-grounded by scholars and practitioners were largely dependent on both their epistemological position; their background and training; and their beliefs about how knowledge was created. As Hein (1998) argued whether knowledge was acquired independently of the learner or constructed in the mind by the learner was an important component of how learning was viewed and what epistemological path was followed. It is difficult to classify theories neatly into distinct groups. Thus five categories have been used to organize the relevant theories—behavioral; cognitive; social; constructivist and sociocultural—with their relevance to museums accordingly outlined.

2.3.1.1 Behavioral theories

The behaviorist paradigm suggests that learning is the result of a change in behavior in response to some external stimulus. The change could be brought about either through “classical conditioning” when two stimuli go together, demonstrated through the experiments conducted by Pavlov. The other way is through “operant conditioning”,

when an organism learns that a response leads to a particular consequence as shown in work of Skinner (Hilgard et al., 1979).

Hein (1998) stated that museums with stimulus-response approaches to education would have exhibitions based on didactic (or expository) education, illustrated by modes of transmission that incrementally add to knowledge through traditional lectures and text. Didactic learning is based on a teacher-student model where the teacher imparts information which the student absorbs in a logical, rational sequence. It mainly involves teaching facts to an “empty vessel” that may not be relevant or interesting. Hein identified that museum exhibitions based on a didactic model are sequential and ordered; have a clear beginning and end; with ideas arranged from simple to complex; and texts that describe what is to be learned.

Another aspect of behaviorist approaches to learning is discovery learning (also called “hands-on” learning). Discovery learning represented a shift in thinking from imparting information, to focusing on the needs of the learner, with the emphasis moving from teaching to learning. Discovery learning became widely embraced in informal learning and museum contexts with children’s museums, in particular, utilizing discovery learning as a framework for structuring their exhibitions and programs (Falk & Dierking, 2000; Zervos, 2003). Museum exhibitions based on a discovery learning model have a wide range of active learning modes that allow for exploration, asking questions and encouragement for visitors to find out answers for themselves (Hein, 1998).

However, some problems with discovery learning have been identified. Although discovery learning encouraged an active process of engagement it still focused on ‘… specific educational outcomes … the learners will learn those things we wish them to learn’ (Hein, 1998, emphasis added). The difficulty with the discovery approach to learning is the concern that learners may not attend to key aspects of the situation or materials presented or may “discover” things that were not intended or relevant, resulting in misinterpretations of the message (Borun, Massey & Lutter, 1993; Hein, 1998).

2.3.1.2 Cognitive theories
Cognitive theories view learning as a process that happens inside a person’s head, and are developmental, occurring across all stages of an individual’s life. Cognitive theories most
relevant to museums are Piaget’s stages of development, Gardner’s multiple intelligences and Bruner’s work on narratives. Piaget (1980) proposed that thinking processes constantly change as humans grow and mature from birth to death, and the ways humans interact with the environment, both learning from it and shaping it.

The potential of narrative approaches to learning have been explored more recently by museums. It is recognized that humans are natural storytellers—since ancient time’s humans have been using stories that represent an event or series of events as ways to learn (Abbott, 2002). Bruner (1986) suggested that humans employed two modes of thought—paradigmatic (or logico-scientific) and narrative. He described imaginative narrative as leading to:-

“… good stories, gripping drama, believable (though not necessarily “true”) historical accounts. It deals in human or human-like intention and action and the vicissitudes and consequences that mark their course. It strives to put its timeless miracles into the particulars of experience, and to locate the experience in time and place (Bruner, 1986).”

Museums are ideal places where stories can be told that encourage visitors to make their own meanings. Bedford (2001) noted that:

“Stories are the most fundamental way we learn. They have a beginning, middle, and an end. They teach without preaching, encouraging both personal reflection and public discussion. Stories inspire wonder and awe; they allow a listener to imagine another time and place, to find the universal in the particular, and to feel empathy for others. They preserve individual and collective memory and speak to both the adult and the child.”

Allen (2004b) researched the use of narrative tools as ways for visitors to make meanings about science. Allen defined narrative in a museum context as taking the personal perspective; involving a series of events; containing emotional content and authentic in origin, with someone telling the story. Allen (2004a) also drew attention to the problem that the museum sector still does not clearly understand how the power of narrative could be used to enhance visitor learning, specifically about scientific principles. McLean (2003) described the ways visitor experiences could be constructed in different types of learning environments, using the analogy of “the campfire, the cave and the well”.

Bedford (2001; 2004) and Rounds (2002) considered that narrative was a powerful way that cultural and social history museums, in particular, engaged visitors; with Bedford
even proposing that storytelling was the “real work” of museums. Bedford argued that stories aided humans in defining their values and beliefs and allowed the listener to project their own thoughts, feelings and memories onto the story and ‘… make connections between museum artifacts and images and visitors’ lives and memories’ (Bedford, 2001). Roberts (1997) used the framework of narrative to explain the shifts in museum education theory over time, and suggested a narrative approach to educational practices as a way to enhance the ways visitors engaged with museums.

2.3.1.3 Social theories

Confucius (undated) recognized the social nature of learning:

“If one learns from others but does not think, one will be bewildered. If, on the other hand, one thinks but does not learn from others, one will be in peril.”

Dewey (1938) also talks about learning from both an individual and social perspective, concluding that learning was a lifelong experience that involved growth through personal judgment and the capacity to act intelligently in new situations. Learning is the interplay and interaction of objective (external) and internal factors, as well as a transition between the individual and the environment at the time. Dewey argued that the social situation was the key to learning, a shared common experience requiring an impulse and a desire through interaction with the environment. He saw the “directing” of learning not as an exercise of power, but as a shared group event, given that learners are part of a community held together by common goals. Rogoff (1999) referred to the conjunction between an individual and the social as the context of learning:

“… the physical and conceptual structure as well as the purpose of the activity and the social milieu in which it is embedded. One must attend to the content and the context of intellectual activity in order to understand thought processes … In order to function, people must be able to generalize some aspects of knowledge and skills to new situations.”

Visitors make their own personal meaning based on prior knowledge and experiences, and use their preferred approaches to learning within the context of an interpretive community. The resulting social interaction tests ideas and meanings, with others in the group acting as a frame of reference.
Falk and Dierking (2000) acknowledged the key role accompanying adults played in facilitating family learning:

“Parents can be effective facilitators for their children’s learning when exhibitions are designed with collaborative learning in mind and when adults feel comfortable with the content and experiences provided in the museum.”

One key finding from research into learning in children’s museums showed that

“…children stayed longer at exhibits and learned more when they were accompanied by an adult who was actively involved in the activities (Puchner et al., 2001).”

Stanton (1999) found that mothers and fathers took on different roles within a visit, with mothers more concerned with the logistics of the visit, and fathers seeing museums as “family business”. Work on literacy and adult learning suggested that an orientation to lifelong learning and readiness to learn in later life was strongly linked to the family (Rubenson, 2000).

Lave and Wenger (1991) proposed a view of learning that located the process of learning as a co-participation in a community of practice rather than just in the heads of individuals. They argued that learning involved the whole person, including their relation to both specific activities and to social communities. Lave and Wenger’s work made a significant contribution to the discussion of the social dimensions of learning advocated by Vygotsky (Daniels, 1996; Vygotsky, 1978). Their underlying premise was to look beyond learning as a cognitive process to a focus on the social context for learning, concentrating on what kinds of social engagement provided the best conditions for learning. Lave and Wenger suggested that learning requires involvement in a practice, not just as an observer but as a participant who also has a responsibility for the outcome: ‘Learning is a process that takes place in a participation framework, not in an individual mind’ (1991). They saw learners as active and contributing members of communities, becoming learners through involvement with, participation in and, finally, full acceptance into a community. Hansman (2001) described communities of practice as

“…self-organized and selected groups of people who share a common sense of purpose and a desire to learn and know what each other knows.”
Communities of practice also ‘… share expertise and passion about a topic and interact on an ongoing basis to further their learning’ (Wenger & Snyder, 2000). Relationships over time and across contexts are important, as is the relation to many other communities of practice that co-exist and overlap (Lave & Wenger, 1991).

Communities of practice can be small, such as friends visiting a museum together where learning is ‘… always sociocultural “situated” within a larger culture and within the social setting of an event’ (Falk & Dierking, 2000).

On the other hand, a community of practice could also involve a broader involvement and engagement with multiple groups. Matusov and Rogoff (1995) proposed that museum learning was active participation in a community of learners, where all participants were recognized and treated as learners who shared interests and expertise. The museum’s responsibility was to guide the process, but not control it:

“… both the visitors and museum staff are seen as active in structuring the inquiry, with museum staff assuming responsibility for guiding the process and visitors learning to participate in the management of their own learning (1995).”

Fasoli (2001) used communities of practice to describe the ways that young children engaged with art galleries and to demonstrate how and what they were learning. The learning that resulted was seen as ‘… a social accomplishment – context embedded and continuously negotiated’. Fasoli particularly found that it was the aspects “outside” of a specific exhibition or program that children remembered and used in their post-visit constructions of their learning, which included their interactions with museum staff and actual features of the building.

2.3.1.4 Constructivism
Constructivism is a theory of learning that focuses on the learner and the meanings they make based on their prior experience, knowledge and interests. Fosnot (2005) suggested that constructivism was not a theory about how to teach, but a different way to think about how learning takes place through the relationships between teachers and learners.

A constructivist approach sees knowledge as being constructed in the mind of the learner with new information being integrated into an individual’s existing cognitive schemata,
and validated not by conforming to ‘… some external standard of truth, but whether they “make sense” within the structured reality of the learner’ (Hein, 1998). The learner as an active agent in control of their learning is an important feature of constructivist thought through ‘… building understanding and making sense of information’ (Woolfolk, 1998).

Constructivism had a major influence on the ways that museums thought about learning during the 1990’s. Hein (1999) explained that constructivist exhibitions enhanced learning through enabling visitors to both validate and also re-think their own interpretations of a subject by allowing them to consider other interpretations, perspectives and ideas about a topic. Museum learning experiences provided under a constructivist framework would encourage learners to use both their hands and their minds to experiment with the world and reach their own conclusions, through choosing what they want to attend to (Hein, 1998).

Studies in museums have continually demonstrated that if people are not interested either in the content or the look of an exhibition they will just walk past without engaging with it (Allen, 2002; Beer, 1987; Bitgood & Patterson, 1993; Falk, 1991; Hein & Alexander, 1998; Kropf, 1992; Moussouri, 1997; Screven, 1995; Serrell, 1998).

In various studies of visitor behavior in exhibitions, choice formed a key part of how visitors used exhibitions in terms of following their own paths, not those set by the museum, with visitors actively choosing which sections they did and did not attend to (Allen, 2004a; Beer, 1987; Falk, 1991; Falk, Koran, Dierking & Dreblow, 1985; Hein, 1998; Screven, 1990, 1995; Serrell, 1998).

2.3.1.5 Sociocultural theory

Sociocultural theory is based on the idea that human activities take place in cultural contexts through social interactions that are mediated by language and other symbol systems and shaped by an individual’s historical development (Ash, 2003; Matusov & Rogoff, 1995; Sedzzielarz, 2003). It also understands, accounts for and makes explicit the ‘… unplanned intersection of people, culture, tools and context’ (Hansman, 2001), emphasizing the importance of culture, environment and history in every learning context and event (Schauble et al., 1996). Sociocultural theory came from the work of Vygotsky
(1978), who proposed that learning is a socially-mediated process where learners, both adults and children, are jointly responsible for their learning. Many of Vygotsky’s ideas have been applied to museums (Anderson, 2003; Ash, 2003; Matusov & Rogoff, 1995; Roberts, 1997).

Falk and Dierking (2000) suggested that ‘... who we are, what we are, and how we behave are products of the sociocultural context in which we are immersed’. They concluded that learning was essentially an individual construct: ‘The sociocultural context defines both who we perceive ourselves to be and how we perceive the world we inhabit’.

Falk and Dierking proposed the contextual model of museum learning to account for factors already identified in their earlier work (1992), but with a more holistic view that recognized the long-term nature of learning (Figure 4).

**Figure 4 The contextual model of learning (Source: Falk & Dierking, 2000)**

In the contextual model the *physical context* consists of the tools and settings of the museum, including architecture, design, objects and subsequent reinforcing events and experiences outside the museum. The *personal context* includes motivations and expectations, prior knowledge, experience and beliefs, interests, choice and control; as well as how these are perceived, filtered and ultimately incorporated into memory and learning. Finally, the *sociocultural context* accounts for within-group mediation,
facilitated mediation by others and cultural mediation (Dierking, 2002; Falk & Dierking, 2000).

Four elements that underpin sociocultural theory as applied to museums have been identified from the literature: individual, culture, environment and historical development (Ellenbogen, 2003a, 2003b; Falk & Dierking, 2000; Leinhardt, Crowley et al., 2002; Matusov & Rogoff, 1995; Paris, 1997b, 1998, 2002; Schauble et al., 1997).

2.3.2 Signage and Museum Learning

Since the function of museums as the educational context has been emphasized (Ames, 1988; Bierbaum, 1988), there have been methodological innovations in investigating how people learn in the interactive museum. In the early stage of museum studies, research often tracked visitors’ behaviors to describe how visitors learn (Diamond, 1986; Hilke, 1989). Since “conversational elaboration” (Leinhardt, Crowley, & Knutson, 2002) is defined as the learning process in museums, visitors’ conversation or talk came to be spotlighted as the window to look into how people learn in museums (e.g., Crowley et al., 2001a; Allen, 2002). Today, learning in museums is defined as the meaning making process which is achieved through negotiation and interaction between visitors and tools. More dynamic and multiple modes such as gesture, talking, and action for using tools in a museum is emphasized for an understanding of how people learn in museums (Rahm, 2002). Today, many of cognitive scientists’ explanations of how humans think and learn do not solely depend on individuals’ internal mental activities. By considering how a human’s cognition is interacting with social others, a mediating artifact, and the environment, cognitive scientists have argued that cognition is distributed beyond the individual to an outside individual (Baetson, 1972; Greeno, 1997; Hutchins, 1995; Resnick et al., 1997; Salomon, 1993). From this perspective of distributed cognition, it has been argued that cognitive processes are socially distributed between people and that cognitive processes are bound to the material structure of cognitive activity (Hollan et al., 2000).
2.4 Techniques of display of items

This section reviews display of items of three out of the five continents. The reason for this being constraint of time and enormity of the document due to too much information.

a) In Europe

Yamaguchi (1991) alludes to how exhibitions in public spaces in European cultures more or less limited themselves to the display of objects. The space called the “museum” refused from the very beginning to admit the smells and sounds of everyday life. Until the 1867 exposition the experiences and scenes of everyday life had been excluded from the pictorial space, which tended to portray ceremonies and scenes from classical mythology. In 1867 Louis Napoleon organized the Paris exposition for the purpose of impressing the world with the stability of his government. The objects in the exposition became the heroes of this new type of festival, in which objects of everyday life were divorced from the contexts to which they originally belonged. Through exhibition these objects acquired new levels of significance as emblems of the power of the regime that organized the space of exposition. The Paris Exposition encouraged the display of everyday objects in a manner similar to the display of high art. This would enable them demonstrate the wide distribution of social wealth in the newly established society as it contrasted to the ancien regime. Via the exposition, the new regime was able to express contemporary feelings about objects and lives. The result was that objects originally meant for the sale as commodities were elevated to the status of “art”. This happened because they were being associated (through the mode in which they were displayed) with paintings and sculpture that portray a mythical world.

b) In Asia

Yamaguchi (1991) critically reviews the Japanese way of exhibiting. In accordance with Japanese culture everything is done for the purpose of exhibiting, from the display in the homes to the clothes that people wear. In every Japanese house of traditional style, there is a space called tokonoma, where decorated objects are shown. Tokonoma functions as a kind of space of exhibition in daily life and domestic setting. Usually an arrangement of flowers is shown against the wall with a picture scroll hung behind it.
c) In Africa

Generally ordinary shops tend to be spaces for display, although people are not usually aware of their effects, which can vary over time and from culture to culture. A consideration of the booths of the fairground throws into relief the deliberate nature of exhibition seen in shops in Kenya. When shopkeepers became aware of how goods could be exhibited, they started to use windows as a kind of showcase, foregrounding certain objects so as to seduce people into buying a wide range of goods. The shop window becomes a theatre for merchandising in much the same way as a circus parade displays a portion of the main performance being put on inside the circus tent (Yamaguchi, 1991).

Exhibition and display design is a spatial experience, and this experience is recreated by stories and atmosphere. Exhibitions, as gathered from the three continents, need be created on the basis of fashioning resonance and wonder. Greenblatt (1991) defines resonance as the power of the displayed object to reach out beyond its formal boundaries to a larger world, to evoke in the viewer the complex, dynamic cultural fold and from which it may be taken by a viewer to stand. This will enhance learning in the museum environment simply due to the wow factor.

2.5 Empirical studies

This section explores two considerations of display design that may be used by museums in developing their exhibitions.

2.5.1 Signage and text considerations

Baxandall (1991) explains that what a label says is not in any normal sense descriptive; it doesn’t cover the visual character of the object. The labels stand to the object in a relationship of a different kind, not descriptive but an explanatory relation.

Research done on labeling has shown visitors most often choose not to read most of the text material provided by museums. Robinson (1930) found out that of those who stopped to view museum exhibits, only about 10 percent read the label. Reading of exhibit labels varied between 8 to 12 percent and only rarely did visitors read an entire label of 200 or more words.
In a museum setting, Robinson (1930) found increases in both percentage of readers and the amount of the label read when the size of the type and the number of paragraphs were increased while simultaneously decreasing the amount of technical wording. Reading increased to over 40 percent of persons stopping at the exhibit as opposed to the 10 percent of readers before the changes were made. Label reading increased for most exhibit labels when the number of words was decreased and the size of the label increased.

Serrell (1981) also reported an increase in label reading when the “visual content” of the label was increased. “Visual content” referred to information that directs the visitors’ attention to the exhibit by asking questions or making comparisons using information that can be visually verified. In Robinson’s study the size of the type, the number of paragraphs, and the reading level of the text were concurrently changed. In Hodges’ study the number of words per label, the content of the text, and the size of the label’s background varied together. And in Serrell’s study the “visual content” varied at the same time as number of words, number of sentences, and other features of the label. Bitgood et al (1986) found out that by manipulating several variables in a controlled manner (changing only one factor at a time), it was possible to demonstrate that the number of words per label, the size of the type, and the position of the label all contributed significantly to label reading.

2.5.1.1 Signage as a tool for structuring museum activity

In a museum as the object-based learning context, signage has been used to provide information which may not be explicitly delivered through the exhibits to visitors (Bitgood, 1996; McManus, 1989; Serrell, 1996). In particular, museums put the educational contents of their exhibits on signage, seeing signage as a tool to communicate that content to visitors. Nevertheless, according to Thompson and Bitgood (1989), the large number of factors that affect visitors’ signage reading has been an impediment to the conduct of empirical studies investigating how signage is used in a museum context and how to design effective signage for visitors’ learning. Because of the lack of guidelines based on empirical data, designing effective signage has been seen as a difficult task in the museum field.
Often museum researchers have admitted that people come to visit museums to interact with the exhibits as three-dimensional visual experience, not signage as two-dimensional graphical panel (Bitgood, 2003). By tracking visitors’ memory of their museum visit, museum researchers proved that visitors are more likely to focus on the exhibits and to interact with them as the main objects of museum experience (Bitgood & Cleghorn, 1994; Stevenson, 1992). Low signage reading rates actually have been reported in several studies (Brennan, 1977; Bitgood et al., 1986). However, it has been argued that successful museum learning experiences often correspond to visitors’ successful communication about educational contents of signage along with their exploration of exhibits (Borun & Miller, 1980; Diamond, 1991). By listening to visitors’ conversation instead of depending on the observation of visitors’ actions, McManus (1989) showed that text of signage is often echoed in visitors’ conversation, and he thus disputed the claim that visitors were reluctant to read signage in museums. The importance of signage as a communicative tool has been raised for supporting visitor’s learning in museums (Serrell, 1996; Schauble et al, 1996).

Seeing signage as an important tool for supporting visitor’s learning expedited museum researchers to investigate how to increase visitors’ signage reading rate in museums. In particular, Bitgood and his colleague have looked into the factors affecting a visitor’s attention to signage from the perspective of environmental psychology. For example, Cota and Bitgood (1994) showed that visitors recall information more easily when information is given in shorter text. Bitgood, Benefield, and Patterson (1990) showed that where to install the signage is a critical factor that affects visitors’ signage reading. Bitgood and Patterson (1992) showed that signage reading behavior could be encouraged by handouts asking questions that can be answered by signage at a zoo.

Based upon findings from several studies looking into visitors’ signage reading behaviors in museums, Bitgood (1996; 2003) proposed that signage could be better read when designed to be distinctive from other stimuli on the museum floor (e.g., font size of text, contrast with setting background, multi-sensory characteristics, etc.), when it could successfully motivate visitors to read by minimizing efforts to read (e.g., through decrease in the number of words per chunk, proximity of label to object, etc), and when it
can provoke visitors’ interest or thought (e.g., by asking questions, confronting and correcting questions, challenging reader, etc). However, getting attention from visitors is not sufficient to guarantee the effect of signage on visitors’ learning.

Effective signage must be designed not only to get visitors’ attention and make them read, but also to successfully encourage visitors to communicate signage content to understand how that content should be considered. Therefore, later signage studies started to examine the effect of signage on visitors’ content or conceptual learning by measuring knowledge gain or memory of the signage content beyond simply observing visitors’ signage reading behavior (e.g., Falk, 1997; Litwak, 1996). For example, Falk (1997) examined the effect of explicit labeling of exhibit clusters on visitors’ comprehension of specific concepts and understanding of the bigger idea. He showed that visitors who visited exhibits with explicit labeling of exhibit clusters learned more about the specific concept of exhibits and were better able to describe the bigger idea of the exhibitions. Litwak (1996) examined the effect of using questions as titles on getting visitors’ attention and promoting learning. In this study, Litwak showed that questions were more effective for visitors’ memory of signage text than were standard statement titles, regardless of whether the questions are cued to be tested, or whether they are exposed in different lengths of signage text.

Since the perspective of distributed cognition has adapted to understand visitors’ learning in the museum field, it has emphasized that visitors’ learning needs to be understood as a meaning-making process through negotiation and interaction between visitors and tools. Many museum studies have looked into how the exhibit as the main meaning-making tool affects visitors’ meaning-making processes as learning in a museum (e.g., Rahm, 2002). However, there has been little progress in studying signage as a tool for visitors’ meaning-making process. Previous signage studies focusing on visitors’ attention to signage or on learning outcomes such as an individual’s knowledge gain or memory recall are limited to addressing how signage as an external tool functions for structuring a museum activity. Therefore, in order to understand how signage particularly functions as a tool for supporting visitors’ meaning-making process in museums, it is necessary to
take a close look at how signage is used in the cognitive processes of museum learning along with usage of the exhibit.

The extensive observation using many techniques such as participant observation, video and audio recording, and interviewing have been seen as the appropriate ways to identify features of the interaction between people and tools in an activity. Based upon this perspective of distributed cognition, there have been efforts to explain how tools function in human cognitive activity (e.g., Cole & Griffin, 1980; Hutchins, 1990; 1995). First, Cole and his colleague argued that the function of tools could be found in amplifying the cognitive ability of the users (Cole & Griffin, 1980). In particular, they indicated that a tool itself can act like an intelligent agent in an activity system and allow people to do things that they could not do without it. For example, Griffin, Belyaeva, and Soldatova (1993) focused on how computer programs play a role in enhancing children’s learning.

In previous literature, signage is often described as a tool encouraging social interaction among visitor groups (Serrell, 1996). Screven (1992) pointed out that museum signage could conceptually orient visitors so that visitors interpret the exhibit. However, these identified functions of signage have not been empirically examined. In addition, little is known about how the usage of signage as a complementary tool for the exhibit is related to exhibit usage.

In a previous signage study, Bitgood and Patterson (1993) showed that signage readers were more likely to engage with the exhibit longer than were nonreaders because signage reading time usually does not conflict with exhibit viewing time. However, this study is still limited to describing the dynamics of using two museum objects for meaning making, as it focused only on the time to use the exhibit. Therefore, it is necessary to take a close look at how signage and the exhibit are used as external tools by considering actions to use signage or talk about it, in order to understand signage as a tool for structuring learning activity in museums.

This review shows that the effectiveness of exhibit labels and signs can be vastly improved through appropriate label design thereby influencing the visitor’s ability to learn in the museum in the midst of other distractions.
2.5.2 Circulation patterns considerations

A circulation pattern is defined as how visitors move within space regarding a sequence of visited items (China conference, 2011). Understanding and discovering the circulation patterns has received much attention from space designers for increasing visitor satisfaction. This basically refers to how visitors circulate through museums; this determines what visitors will see, where they focus their attention, and, ultimately, what they learn and/or experience. If visitors enter a gallery on the right side of the door, then turning right is the most economical response. However, if visitors enter a gallery along the left-hand wall, then continuing straight is the most economical response (Bitgood, 1988)

Visitor movement at first appears chaotic. Some studies have found high rates of turning right at choice points, others have not. Some studies have found random-seeming movements through exhibitions; others have observed predictable walking patterns. This lack of apparent consistency in visitor circulation patterns led Falk to conclude:

“A considerable body of research documents that visitors to museums rarely follow the exact sequence of exhibit elements intended by the developers. . . . Visitors will fulfill their own agendas, for example, turning right (Melton 1972; Porter 1938) or leaving from the first available exit (Melton 1972), rather than doing what the developers intended (1993, 117). “

The above statement seems to imply that if visitors do not follow developers’ intended traffic pattern, the exhibit design must not have a strong influence; therefore, a visitor-centered explanation (agenda) must account for visitor behavior. Is it possible that exhibit designs inadvertently create some of the unexpected, unwanted traffic patterns? While Falk may be correct about visitors not following the intended path of the developers, his appeal to “agendas” may be an insufficient explanation for visitor circulation patterns such as turning right and leaving by the first available exit.

Inertia (and exit gradient) —There is a tendency for people to continue walking in a straight line (generally toward a destination) unless some other factor captures their attention and pulls them away. In many ways, this is similar to the principle of inertia in
physics. Melton’s (1935) “exit gradient” concept (tendency to take the straightest line between the entrance and exit) is considered a special case of this phenomenon. Note that walking a straight line between two points involves the fewest number of steps. It takes a more powerful force (such as a landmark exhibit) to divert visitors from this pattern.

**Backtracking** — Exhibitions that require backtracking to see all of the exhibit displays are undesirable because visitors do not want to waste time and energy (which is likely to hasten fatigue). Taylor (1986) in his study at the Steinhart Aquarium, observed that visitors expressed a desire to see the whole aquarium, but were unwilling to backtrack. Taylor noted that “. . . the tendency to avoid backtracking is so strong that the only visitors who did see the entire aquarium were repeat visitors who were familiar with the layout”

**One-sided viewing** — there is a tendency for visitors to move along only one side of a path through an exhibition. When exhibits or objects are displayed on both sides of a path, there is competition for visitor attention between the two sides and one or both sides will have a lower rate of attention and/or approach. To save steps, many visitors continue along one side. We might speculate that the distance from one side to another and the amount of traffic flow will strongly influence crossing the path. Thus, wider pathways and crowded conditions will discourage path crossing. Weis and Boutourline (1963) were among the first to note that visitors rarely cross from side to side within an exhibit hall unless they detect the presence of landmark exhibits on opposite sides.

**Main (dominant path security)** — In several of our projects, we have observed visitors avoiding pathways that are cut off visually from the main path. There may be some type of way finding security staying on the main path. There is also the possibility that perceived effort outweighs the possible benefits of walking far off the main path. Deans, Martin, Neon, Nuesa, and O’Reilly (1987) reported that the largest circulation pattern at the Reid Park Zoo was on the perimeter path that circled the zoo. This path was probably perceived by visitors as the main path. By remaining on the main path, one avoids the extra walking involved in exploring other pathways.
2.5.3 Museum Design and Circulation

Peponis and Hedin (1982) investigated the ways in which the spatial representation of knowledge was reflected in and transmitted through the morphology of exhibition layout. Later, Choi (1999) investigated patterns of exploration and encounters in eight museum settings. His findings suggest that both deterministic and probabilistic models modulate and structure visitors’ exploration patterns. Another study by Peponis and his colleagues (2003) has concentrated on open plan science exhibitions and the effect of exhibition layouts on visitors' spatial behavior.

Falk (1982), Serrel (1995) and Sandifer (1997) have suggested that the length of time visitors spend involved in an exhibition element predicts a visitor's engagement, and thus learning. The result of this study has been used later as a convention for measuring learning by visit duration (or stop time), in Peponis (2003). Although previous studies on museums established that there is a link between visitors' patterns of exploration and physical design, how and through which means this link is predicted needs to be well understood. Visibility is a critical aspect of physical design that influences visitors’ spatial behavior.

Museums of the modern movement reflected the `modern' ideals, such as “form follows function", and “transparency" in materials and functional boundaries. These ideals have re-introduced museum design by suggesting that an interior be merely defined with circulation space (form follows function), or be divided by only a few partitions in a rectangular volume (transparency). Two examples of modern designs, the “Museum of Unlimited Growth" (1939) by Le Corbusier (Figure 5), and the New National Gallery (1942) by Ludwig Mies van der Rohe in Berlin, illustrate these attempts (Montaner, and Oliveras, 1987). Le Corbusier's project illustrates a design in which continuous circulation dominates the museum's spatial organization. This scheme later appeared as a basic idea for the Guggenheim Museum (1945) by Frank Lloyd Wright, presenting restricted circulation around a central core. It has been argued that Le Corbusier's project is a modern re-interpretation of classical museum designs occurring in the nineteenth century with restricted/controlled circulation. Mies van der Rohe's building, on the other hand, suggests a museum environment in a rectangular volume, in which spatial
organization barely implies a circulation path and vaguely divides gallery spaces with a few partitions.

Figure 5“Museum of Unlimited Growth” (1939) by Le Corbusier, sketch

(Source: Montaner and Oliveras, 1987)

This building houses a volume that would have only a little influence on possible circulation paths that visitors may choose. Mies’ museum design is noted as having some need for additional restrictions which could be created through the exhibition layout (Searing, 1986). Architectural historians argue that this building is a complete break with traditional museum design, and introduces a modernist flexibility in circulation with open plan organization (Quetglas, 1988).

This empirical study leads the researcher to conclude that good circulation patterns vary according to the general building design which in turn influences how items will be displayed. This in turn affects visitors’ attention vis a vis learning.

2.6 Design approaches to exhibit design

Bitgood (1994) explains that while designers rarely adopt only a single approach, they sometimes place heavier emphasis on one approach at the expense of others. Both the nature of the exhibition and the bias of the designers are likely to play an important role
in establishing the approach which guides exhibit development. Hopefully, the implications of the various approaches are considered in the design process. If the exhibit is to be a success in the broadest sense (in terms of multiple criteria for success), it is critical that the strategies guiding development be made explicit as well as be consistent with the goals and objectives of the exhibit (Bitgood, 1994).

The various exhibit design approaches are not mutually exclusive. Designers usually have more than one strategy in mind when they design exhibits. For example, museums are often concerned that exhibits be designed so that they have both educational and recreational outcomes (Bitgood, 1994). By considering the possible impact of each design approach, exhibits have a greater chance of meeting their goals and objectives. Many of the conflicts among members of an exhibition design team can be traced to differences in basic philosophy of design. Some professionals (often experts in the specific discipline) attempt to saturate the exhibit with detailed information without regard to the interests and/or cognitive processing abilities of the audience. Here, this approach is called the "subject-matter" approach. Other professionals (often with training in art and design) may be primarily concerned with adherence to traditional principles of art. Such individuals emphasize the "aesthetic" approach. Still other professionals (often advocates of let-kids-play-as-an-end-in-itself) are concerned primarily with designs that produce fun experiences with less concern for educational or aesthetic goals. This is the "hedonistic" approach.

2.6.1 Design Approaches That Employ Realism

A common design strategy (especially in zoos and natural history museums) is to create a visitor experience that simulates reality. Realistic exhibits may be justified for at least three reasons: (1) it may be assumed that realistic exhibits have greater attracting and holding power; (2) the experience of realism is assumed to have educational value in itself (visitors learn what an animal's habitat is like from a diorama); and/or (3) realistic exhibits have more affective impact.

At least four examples of the realistic approach can be found. First, is the diorama approach to exhibit design. Dioramas in natural history museums were originally
designed to convey information about the habitat of animals on exhibit (Wonders, 1993). Dioramas were initially developed over one hundred years ago in natural history museums in both the United States and Sweden exclusively (Wonders, 1993).

Dioramas, in their purest form, present animal species within a context of natural habitat including three dimensional, realistic-looking objects (trees, rocks, etc.) and a background painting on the back wall. Only recently has the effectiveness of dioramas been objectively studied (Davidson, Heald, & Hein, 1991; Dyer, 1992; Guisti, 1994; Harvey, Birjulin, & Loomis, 1993; Peart, 1984; Peart & Kool, 1988; Peers, 1991; Thompson, 1993). These studies suggest that: (1) dioramas are popular with visitors and tend to generate higher visitor attention than other types of exhibits; and (2) dioramas can be combined with "hands-on" and audio-visual media to increase the exhibit's impact on visitors.

Second is the concept of concreteness formulated by Peart (1984), Kool (1988), and Peart & Kool (1988). These investigators argued that 'concrete' exhibits (or realistic exhibits with three-dimensional objects) are more successful than 'abstract' (or exhibits with text and no objects) in terms of attracting and holding power, but 'abstract' exhibits are more effective in terms of teaching power.

A third example of the realistic approach is simulated immersion. Exhibits are designed so that visitors feel they are in the time and place simulated by the exhibition. Coe (1985) has argued that landscape immersion exhibits in zoos provide an important educational experience to visitors.

Finally, virtual reality is still another approach to realism. Although museums are only beginning to use this technology, it will undoubtedly become a popular approach in the next few years. Virtual basketball is available now at a number of science museums and shopping malls. More sophisticated virtual reality exhibits with clear educational aims are currently being planned by a number of museums.
2.6.2 The Hands-On Approach

"It is a widely held and influential dictum in mainstream education that the learner should be actively involved in the act of discovery ...." (Alt and Shaw, 1984). In the last several years this dictum has led to the domination of "hands-on" exhibits in some informal learning institutions. Science centers and children's museums have especially emphasized the "hands-on" or participatory approach to exhibit design. Perhaps this is because children, more than adults are more attracted to such exhibits as indicated by visitor studies (e.g., Koran, Koran, & Longino, 1986; Rosenfeld & Turkel, 1982). Koran, et al. found that children were more likely than adults to interact with "hands-on" exhibits. Similarly, Rosenfeld and Terkel (1982) found that children interacted more than adults with animals and a zoo game; adults, on the other hand, spent more time than children reading labels.

There is evidence to support the argument that hands-on activities produce more success (at least in terms of attracting and holding power) than passive ones (e.g., Melton, 1972), although hands-on components by themselves don't ensure success (e.g., Borun, 1977). Borun found that simple button pushing detracted from the impact of an exhibit. To ensure success, hands-on exhibits must be carefully designed and evaluated during the development process. An example of an unsuccessful hands-on exhibit may be instructive. An exhibit on gravity modeled after the "Falling Feather" Exploratorium Cookbook exhibit was evaluated in a science museum (Bitgood, 1991a). Eight steps had to be followed in order to understand that a feather and a piece of metal will fall at the same speed in the absence of air, but when air is present, the feather falls slower because of air resistance. Following all eight steps was complicated and took a considerable amount of time. Although about 45% of the visitors studied spent more than two minutes at the exhibit, only 25% of those who spend this amount of time were able to observe the phenomenon being demonstrated either because they did not follow instructions correctly or because the exhibit did not function properly. If this exhibit had been tested on visitors during development, it might have been altered to correct these problems.
Bitgood, Kitazawa, and Patterson (1995) found that hands-on exhibits differ in the amount of participation they generate, some stimulating more child interaction while others produce more adult hands-on behavior. Thus, the design of such exhibits may determine who participates and how much.

If hands-on exhibits are to be successful, they should follow design principles outlined in the literature (e.g., Bitgood, 1991b; Kennedy, 1990; Norman, 1988). While hands-on exhibits may be preferred by visitors (especially children), it does not guarantee "minds-on". Bonin and Adams (1991) have shown that designing these exhibits so that they deliver the intended message is often problematic. There is little doubt that the participatory approach to exhibit design has bred many successful exhibits. But, it is also important to note that exhibits can be successful without physical participation. For example, dioramas can be appreciated without "hands-on" elements; art objects can be enjoyed by viewing. Passive experiences can make successful exhibits.

2.6.3 The Social Facilitation Approach

Many have asserted that museum visitation is primarily a social event (e.g., Falk & Dierking, 1992). From this perspective, it is argued that people go to museums and zoos to be with family and friends. Consequently, exhibits should be designed to encourage such social interaction. An additional rationale for the social facilitation approach is that important learning can take place best within this social context.

Visitor researchers have collected data on visiting groups since the late 1970s. Only a few examples will be provided here. However, reviews of family group behavior in museums can be found (e.g., Falk & Dierking, 1992; McManus, 1994). In one of the earliest reported studies, Cone & Kendall (1978) observed family visitors at the Science Museum of Minnesota. They observed family interactions and attention to exhibits during the visit. Among other results, they found dioramas to be the most successful type of exhibit in terms of percentage stopping, viewing time, and recall data. Whether dioramas are more successful with families than all adult groups was not determined from this study.
Diamond (1986) conducted a detailed analysis of family visits to two museums using an ethnological methodology. A sophisticated recording system documented many types of family interaction, both with each other and the exhibits. Her findings suggest that it is extremely important to study the family as a unit of analysis since family members clearly influence each other. For example, teaching behavior in the form of parents showing children what to do was commonly observed.

Diamond, Smith, and Bond (1988) in their report evaluating the California Academy of Sciences Discovery Room, argued that exhibits in a discovery room should be designed "to create a social environment as well as a physical structure." They suggested that an adult's presence influences children in two ways: it appeared to reduce the timidity of the child, and it caused the child to slow down long enough to attend to objects.

Evidence that adults behave differently with children than they do with other adults was shown in a study by Bitgood and Patterson (1993). Dramatic differences in viewing time were found at a child-oriented exhibit — adults viewed the exhibit longer when they were with children than when they were with other adults. The social facilitation approach is obviously important for exhibit designers to consider. It also has limitations. When a group is composed of older children, there is less need for social facilitation. Bitgood, Kitazawa, and Patterson (1995) argue that when children are young and cannot read themselves, they are dependent upon adults to provide information to "make sense" of an exhibit. Once children are old enough to extract information themselves, there is less need for high rates of social exchanges between parent and child.

Another limitation of the social facilitation approach is that some topics may lend themselves poorly to social experiences. Still another limitation: group influences maybe distracting. For example, when an adult is attempting to read an exhibit label, a young child's demand for attention often prevents the adult from completing the reading task. There is no doubt that social behavior is an important part of the museum visit for the majority of visitors. But the nonsocial visitor should also be considered. In some situations, it might be appropriate to design an exhibit so that it provides different types of experiences for groups who wish to socially interact as well as for individuals who wish to experience an exhibit in a solitary manner.
2.6.4 The Individual-Difference Approach

The individual-difference approach emphasizes the diversity of museum audiences. This approach attempts to design an exhibit in a way that provides something for everyone.

2.6.4.1 Cognitive Ability

Assuming that people learn in different ways according to their level of cognitive ability, Greenglass (1986) designed an exhibit for two different conceptual levels or information processing abilities. In the "high-structure" exhibit the tasks to be completed and the information to be learned were clearly stated; in the "low-structure" exhibit the visitors were given little or no guidance concerning the task. An independent measure of visitor conceptual level was used to objectively determine a measure of ability. Those who obtained high conceptual level scores learned equally well at both exhibits; whereas those with low conceptual level scores learned better with high structure exhibit than the low structure one. The implications of this study: designing for the lowest level of conceptual ability seems to produce desired outcomes for all levels.

2.6.4.2 Learning Style

Vance and Schroeder (1991) studied the effects of two types of exhibit labels on visitor learning style. The learning style of visitors was determined by the Myers-Briggs Type Indicator test. Two types of labels were designed. An "intuitive" type of label was designed for learners who were interested in reading and problem solving. "Sensing" labels were designed for learners who directly apply their five senses to the exhibit. The major findings were that learners defined as "intuitive" on the Myers-Briggs test performed better on a test of knowledge when intuitive labels were present, while visitors defined as "sensing" performed better when sensing labels were used. These results are consistent with the notion that learning styles influence visitor performance.
2.6.4.3 Interest Levels

The Prehistoric Journey exhibition at the Denver Museum of Natural History (Marino, 1994) is being designed to accommodate three types of audiences: "discoverers," "explorers," and "studiers." Discoverers are assumed to spend the least amount of time with exhibits; they prefer hands-on exhibits and are most likely to respond if the exhibit contains some type of high interest material. Explorers are assumed to be those visitors who experience the exhibits in a more involved manner, occasionally looking closely at things that are of interest to them. Studiers are assumed to be highly motivated learners who spend the time necessary to absorb complex information. They read labels, study diagrams and discuss the exhibit with other group members. Even if data does not support the notion that visitors can be easily divided into these categories, designing for this range of audience interest may be a useful way to provide exhibit material for a wide range of interest levels and for varying interest levels within the duration of a visit.

2.6.4.4 Demographic Characteristics

Numerous studies have found differences between males and females, between adults and children, and between more educated and less educated visitors. The characteristic of age is often used as a basis for designing exhibits (e.g., children's museums). While exhibit design does not often consider gender differences, such considerations might prove useful to ensure that both male-female interests and points of view are represented.

2.5 Conceptual Framework

The empirical studies informed my knowledge on how to design effective display attributes for augmenting learning in museums. The conceptual framework is derived from the literature reviewed and the research questions. It shows the interrelationship between the dependent variable which is learning and the independent variables which are circulation and label design.
Figure 6 Conceptual framework
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction
This chapter presents the study design and methodology used in gathering information for the purpose of the study. This has been done in terms of introduction, research design, target population, sampling design, data collection instruments and procedures, and data analysis.

3.2 Research Design
This research is a case study. It took the particular form of a multiple case study model. The study applied case study research design strategy to a sample of two public Museums out of the total of twenty nine accredited National Museums of Kenya. Yin (1984) explains case study as a form of qualitative descriptive research, which looks intensely at an individual or small participant pool, drawing conclusions only about that participant or group and only in that specific context. Researchers do not focus on the discovery of a universal, generalizable truth, nor do they typically look for cause-effect relationships; instead, emphasis is placed on exploration and description (Yin, 1984).

This study has presented the case study as an alternate form of research strategy, suitable for investigation of contextually rich events or phenomena, especially those which: may be queried using how or why questions; or where the researcher can exercise little control; and which focus on contemporary, rather than historic information (Yin 2003).

A multiple case study enables the researcher to explore differences within and between cases; since the two are both museums with one goal but from different locations. The goal was to replicate findings on display design across cases. In this study interviews, photographs and focus group discussions (FGD’s) were used to collect data. In qualitative research, analysis is often concurrent with the data collection phase rather than subsequent to it.
Figure 7 Research design showing the data collection methods and analysis

Multiple Case studies

- Narok Museum
- Fort Jesus

- Focus Group Discussion
- Photographs
- Interviews

Open coding

Words ➔ Themes

Cross case analysis
These two Museums were chosen for the following reasons; Fort Jesus Museum was declared a world heritage site by UNESCO in June 2011 in France. The elevation put it at par with other world heritage sites including the Old City of Jerusalem, the Pyramids at Giza in Egypt and The Vatican (Statistics Kenya, 2011). Fort Jesus is also a well established Museum with a very high visitor turnout per annum. On the other hand Narok National Museum is a small temporary Museum in the richest County in Kenya. It exhibits items of the Maa culture which is unique and the tribe is popular due to their preserved long culture. Despite education, civilization and Western cultural influences, the Maasai have clung to their traditional way of life. This museum is also en-route to the seventh wonder of the world, The Maasai Mara, which receives a very large number of visitors but the Museum has very low turnout though it could actually speak volumes on the Maa culture.

Table 3-2-0-1Visitor statistics (a) 2009-2011and (b) 2010 – 2012 categorized by residents in and outside East Africa, Kenya and special groups.

<table>
<thead>
<tr>
<th>Museum</th>
<th>2009-2010</th>
<th>2010-2011</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non Residents outside E.A</td>
<td>Residents within E.A</td>
<td>Visitors</td>
</tr>
<tr>
<td></td>
<td>Adults</td>
<td>Children</td>
<td>Adults</td>
</tr>
<tr>
<td>Fort Jesus</td>
<td>27,314</td>
<td>1,846</td>
<td>1,550</td>
</tr>
<tr>
<td>Narok</td>
<td>22</td>
<td>15</td>
<td>0</td>
</tr>
</tbody>
</table>

Most qualitative researchers would agree with Snider’s (2010) observation that numbers impress, but unfortunately, also conceal far more than they reveal. They would also agree
with Davis’s (2007) observation that “good qualitative research has equaled, if not exceeded, quantitative research in status, relevance, and methodological rigor”. Several principles guide the thinking and planning stages of most qualitative researchers. Qualitative research, in all of its complex designs and methods of data analysis, is guided by the philosophical assumptions of qualitative inquiry: To understand a complex phenomenon, you must consider the multiple “realities” experienced by the participants themselves—the “insider” perspectives. Natural environments are favored for discovering how participants construct their own meaning of events or situations. The search for an objective reality, favored by quantitative researchers, is abandoned to the assumption that people construct their own personalized worlds.

The most common sources of qualitative data include interviews, observations, and documents (Patton, 2002), none of which can be “crunched” easily by statistical software. The description of people’s lived experiences, events, or situations is often described as “thick” (Denzin, 1989), meaning attention is given to rich detail, meaningful social and historical contexts and experiences, and the significance of emotional content in an attempt to open up the word of whoever or whatever is being studied. The goal of qualitative data analysis is to uncover emerging themes, patterns, concepts, insights, and understandings (Patton, 2002). Qualitative studies often use an analytic framework—a network of linked concepts and classifications—to understand an underlying process; that is, a sequence of events or constructs and how they relate.

3.3 Population
The target population of the study constituted all the visitors to the twenty Museums in Kenya; the accessible population consisted of all the visitors to Narok National Museum and Fort Jesus Museum during the months of December 2012 and February 2013. Also curators and exhibition designers.

3.4 Sampling Procedure and Sample Size
Sampling is a process of selecting a number of individuals or objects from a population such that the selected group contains elements representative of characteristics found in the entire group (Orodho, 2001). Orodho also defines a sample as a part of large population, which is thought to be representative of the larger population. As noted by
Sandelowski (1995), sample sizes in qualitative research should not be too small that it is difficult to achieve data saturation, theoretical saturation, or informational redundancy. At the same time, the sample should not be too large that it is difficult to undertake a deep, case-oriented analysis. Creswell (2002) has recommended that 3-5 participants be used for case study research. With regard to the use of focus groups, the following recommendations have been made: 6-9 participants (Krueger, 2000); 6-12 participants (Johnson & Christensen, 2004); 6-12 participants (Bernard, 1995); 8-12 participants (Baumgartner, Strong, & Hensley, 2002).

The sample size was divided into two; twenty four visitors to the two public Museums (Narok National Museum and Fort Jesus Museum) and six key informants. The information was collected from both men and women. Simple random sampling enabled the researcher to choose a sample for the interviews and the focus group sample. The focus group comprised of four exhibition designers and two curators.

Table 3.4-0-1 Sample size

<table>
<thead>
<tr>
<th>Gender</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>12</td>
</tr>
<tr>
<td>Female</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
</tr>
</tbody>
</table>

(Researcher, 2012)

3.5 Data Collection method

There were two types of data; primary and secondary data. Desk review of literature formed secondary data while the tools for fieldwork were interviews to individual museum visitors, photographs of circulation patterns and focus group discussions with curators and designers. An interview is an oral administration of a questionnaire or interview schedule (Mugenda, 2003). Part of the data was collected inform of a survey done through interview schedule and it was self administered for uniformity of approach (Mwituria, 2012). The survey consisted of eighteen semi-structured questions. The data was recorded by note taking and video.
3.6 Data Collection tools

Primary data

a) Interview schedule; this was in the form of a questionnaire that was used to collect information on labeling and display from the visitors.

b) Photographs; the researcher took pictures of different visitors walking round the two museums.

c) Focus group discussions; the researcher engaged exhibition designers and curators to understand their role in museums.

Secondary data

a) Journals; various journals were read to enable the researcher to gain more knowledge from other researchers on museum and learning ideologies.

b) Books; book were instrumental in providing structure and also scholarly information.

c) Websites; the researcher used the internet to read different articles and also download information on data analysis.

3.7 Data Analysis

Schwandt (2001) explains the major goal of the researcher is to compare the selected cases as they are expected to yield similar data or different predictable findings. In such instances, a cross-case analysis is a natural choice. A cross-case analysis involves analyzing data across the cases (Schwandt, 2001). Gall et al. (1996) outlined two approaches to case data analysis: Interpretational Analysis: the researcher is looking for patterns (threads, constructs, commonalities, etc.) within the data to explain the phenomenon. Structural Analysis: Investigate patterns which may be found in conversations, text, activities, etc., with little or no explication as to pattern meaning.

From the information above, analysis in this study was done from the onset; it included what has already been discovered from secondary data and what was collected from fieldwork. Data analysis involved interpreting information collected from respondents.
The researcher collated and compiled them by use of data editing, data coding and data tabulation.

The researcher compared the two museums since they have different display designs but a common function which is education for the uneducated masses. The tests were on patterns that explained any event discovered in the data and patterns that had no explanation to pattern meaning. The data was then coded by using similar words which were in turn used to create themes. Then the results were presented, analyzed and interpreted to give a report as shown in the next chapter.

3.7.1 Pilot study
The researcher conducted a pilot study to test whether the proposed methods or instruments are appropriate or too complicated. The interview schedule was tested on six participants, three who visited each museum. The researcher found out that some of the questions in the schedule were not very clear to the respondents. Thus these questions were adjusted to suit the objectives of the study. The order of the questions was also not appropriate. The study also showed that majority of the people did not read the labels that had long paragraphs. The visitors to Fort Jesus were happy with the display of objects and the sequencing of items. Visitors to Narok were not pleased with the display of items and proposed that a better job can be done.

When asked on why they visited the museums they said that they wanted to learn more on the cultural history of both museums. When asked on what they learnt they could not elaborate. They recommended that cultural history museums are very important to the history of a people and therefore museums should care more for the museums for the sake of generations to come.

3.7.2 Reporting the results
The following instruments were used for data presentation;

- Tables; tabular presentation of data allows large amounts of raw data to be stored and reorganized in a neat format and allows the inclusion of only the most relevant data.
• **Pie charts;** Are circles divided proportionately and shows what percentage of the whole falls into each category. These charts are simple to understand. They convey information regarding the relative size of groups more readily than does a table.

• **Comments from the respondents**

3.8 Summary
This chapter has outlined the research methodology adopted in this study that links the literature review on exhibition and display design considerations in museums. The investigation incorporated the how and why of the current situation and how it can be improved upon in relation to developing exhibitions.
CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction
This chapter presents the findings based on photographs; focus group discussions and interviews administered to visitors from both Fort Jesus and Narok National museums the results and findings are presented and summarized in tables and charts. The results are organized in light of the understanding and acceptance of messages delivered through the effect of signage and text consideration, display of items and visitor circulation patterns.

The data in this study is mostly qualitative. The data were collected by conducting interviews in the English language which were administered by the researcher. The researcher interviewed visitors to both Fort Jesus and Narok National Museums. (The interview schedule is attached in appendix III). This data was collected in order to discover signage usage in museums. The researcher also took photographs of visitors walking in and around the museum. The purpose of this was to determine circulation paths and patterns. Lastly the researcher conducted Focus group discussions (FGD’s) with exhibition designers and curators of museums. These were the key informants who assisted in designing the most effective way of displaying an exhibit.

4.2 Response Rate
A total of 29 visitors from both museums were interviewed. Most of questions from the interview schedule were duly answered. For the focus group discussions, two curators and four exhibition designers participated in the discussion. This represents a high response rate. This survey can therefore be said to be successful. In addition more males than females were interviewed. The researcher also took 79 pictures depicting people’s circulation patterns in the museums. The results of the response rate are as shown in figure 8 below:
4.3 Personal Information

4.3.1 Level of Formal Education

This question was intended to find out from the respondents the relationship between level of education and their ability to learn in the museums by understanding the story the curator intended to tell. The data as presented on figure 9 showed the following: a majority of the respondents said they had tertiary education. A smaller number said they were post graduates, very few said they were secondary school leavers. The interviewer did not interview any primary school student or anyone whose highest level of education was primary school.
Figure 9 Showing level of education

(Author 2013)

Based on the data on figure 9, it can be concluded that the majority of respondents had some form of tertiary education.

4.3.2 Age

Figure 10 indicates that 48% of the respondents are within the age range of 18-25, 24% within the range of 36-45, 28% of respondents are within the age range of 26-35, and 0% within the age range of 46 and above years of age meaning no one of that age was interviewed though they visited the museum. This shows that Museums have a diverse range of visitors in terms of age. These results, however, indicate that the majority of respondents fell within the age range of 18-25.
4.3.4 Residence of visitors

This part of the study set out to establish the residence of the visitors. Figure 11 below shows that the majority were from Kenya thus local visitors. To the Kenyan visitors, the question posed to find out which part of the country they resided. The data collected showed that they came from; Thika, Kisumu, Narok, Nakuru, Nairobi, Voi and Kapsabet. The chart also shows respondents by country of residence.

Figure 10 Showing the age of respondents interviewed

(Author 2013)

Figure 11 Respondents by country of residence

(Author 2013)
4.3.5  Reason for visiting the museums

This study explored the reasons that people give for visiting museums. People gave different reasons for their visits.

Table 4-0-1.1: Reasons for museum visits

<table>
<thead>
<tr>
<th>Responses</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>We learn about museums in school but I have never been to one</td>
<td>EXPLORE</td>
</tr>
<tr>
<td>To see how things are changing</td>
<td>EXPLORE</td>
</tr>
<tr>
<td>To compare it with the history taught in school</td>
<td>EXPLORE</td>
</tr>
<tr>
<td>To see the various items used by people in the past</td>
<td>LEARN</td>
</tr>
<tr>
<td>Am interested in history</td>
<td>LEARN</td>
</tr>
<tr>
<td>To enrich my knowledge</td>
<td>LEARN</td>
</tr>
<tr>
<td>To learn about the Kenyan culture</td>
<td>LEARN</td>
</tr>
<tr>
<td>To learn about the history of Fort Jesus and the Maasai people</td>
<td>LEARN</td>
</tr>
<tr>
<td>It is a school trip</td>
<td>LEARN</td>
</tr>
<tr>
<td>Museums are interesting</td>
<td>LEISURE</td>
</tr>
<tr>
<td>To entertain myself</td>
<td>LEISURE</td>
</tr>
<tr>
<td>To pass time</td>
<td>LEISURE</td>
</tr>
</tbody>
</table>

Their responses were coded in three ways; exploratory, for the purpose of learning and if their visit was for leisurely purposes. The data in table 4.0.1.1 above shows that a majority visited for the purpose of learning.

4.4  Signage and text considerations

The study investigated several aspects of signage and texts including the following:

(i) Legibility and Readability

**Legibility** can be defined as the ability a human reader has to read something without effort. Often, the size of font chosen restricts legibility. **Readability** can be defined not on a letter by letter basis, but how the combinations of letters are read within a larger body of text. In other words, readability is defined by the amount of effort one needs to make to read text, not single characters.

(ii) Adequacy of information on paragraphs
This was because these aspects are pertinent to the design of all signage in Museums.

After a respondent had been sampled for an interview, their actions were looked into as they walked through the gallery. After completing the tour the visitor was interviewed. To explore how visitors made use of signage as the mediating tool for meaning making of the exhibit, their actions in using signage were tracked. Each action was separately coded by using the following four coding schemes:

- **No usage**: Or, visitor took a quick glance at the signage, but he or she did not really pay careful attention to the sign content.

- **Listen/ Look**: Visitor passively listened and looked at the signage while guide or friends read aloud the signage text or talked about the signage content.

- **Skim/ Read alone**: Visitor skimmed or read the signage alone without speaking out loud.

- **Read out loud/ Talk about signage content**: Visitor read the signage text aloud or talked about the signage content loudly while his or her attention fixated on the signage.

### 4.4.1 Legibility and readability

The study investigated whether the respondents read all the labels pertaining to the different objects that they viewed. It also sought to explore if the information seen could be easily read or noticed effortlessly. From the data collected, a large number of the respondents indicated that they did not read all the labels while a few read all of them. The results are shown in figure 12 below.
The researcher also sought to find out if the labels were easy to read. A majority from both museums reported that they were easy to read while few reported difficulty in reading.

Figure 12 Did the respondent read all the labels?

Figure 13 Respondents readability

(Author 2013)
4.4.2 Comprehension

These questions wanted to find out whether there were words that they did not understand on the labels. The responses are shown on figure 14 on whether there were words that could not be understood; very few said that there were words that they couldn’t understand. This was common especially with the tourists who did not understand Kiswahili or Maasai. As these two museums have such words as “emurata” and “Kiti cha Enzi”. Text that is difficult to understand impedes visitor motivation to read.

![Language barrier in the labels](image)

**Figure 14 Shows words that could not be understood**

*(Author 2013)*

4.4.3 Adequacy of information in paragraphs

When asked if they thought that the information provided in the paragraphs was enough to learn about the history and meaning of an object, majority said yes whilst very few said no while the other minority said that they were long and boring. Figure 15 below gives this information.
Figure 15 Were the paragraphs used for the labels adequate?

The focus group discussions informed that it’s not possible to give all the information explaining the story of the object in a paragraph as that may bore the visitors.

4.4.4 Did you learn more from the objects, labels or guide?

The respondents were asked where they got most of their information from. The question was posed as “Did you learn more from the objects, labels or guide?” Most of them learnt from the labels as shown on figure 16 below. The guide also seemed to have a lot of influence on most respondents as they spoke different languages. Then the interviewer probed further in order to find out what exactly they had learnt about most of the respondents could not specify.
4.5 What they learnt

This part of the study compared the respondents level of education with the time spent in the museum and what they said they had learnt. The data on table 4.0.1.6 shows that the more time someone spent in the museum the greater their chance of learning something. It also shows that the majority of the college students learnt something. The data also shows that some people learnt nothing even after spending 30 minutes time in the museum even with a high level of education.

Figure 16 Did you learn more from the objects, labels or guide?
Table 4-0-1.6 Time spent vs. learning

<table>
<thead>
<tr>
<th>Education</th>
<th>Time spent</th>
<th>What they learnt</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>Half Hour</td>
<td>History of objects</td>
</tr>
<tr>
<td>PG</td>
<td>One Hour</td>
<td>Historical background of objects</td>
</tr>
<tr>
<td>PG</td>
<td>One Hour</td>
<td>Trade between Asia and Africa</td>
</tr>
<tr>
<td>PG</td>
<td>Half Hour</td>
<td>Nothing</td>
</tr>
<tr>
<td>PG</td>
<td>One Hour</td>
<td>the paragraphs are too long and boring to read</td>
</tr>
<tr>
<td>PG</td>
<td>One Hour</td>
<td>The historical use of objects</td>
</tr>
<tr>
<td>PG</td>
<td>One Hour</td>
<td>Origin of items and new names</td>
</tr>
<tr>
<td>PG</td>
<td>Two Hours</td>
<td>History of various artefacts</td>
</tr>
<tr>
<td>S</td>
<td>Half Hour</td>
<td>Historical background of objects</td>
</tr>
<tr>
<td>S</td>
<td>One Hour</td>
<td>Many things about the objects</td>
</tr>
<tr>
<td>U</td>
<td>More</td>
<td>History of objects</td>
</tr>
<tr>
<td>U</td>
<td>More</td>
<td>The circumcision story of the Maasai</td>
</tr>
<tr>
<td>U</td>
<td>More</td>
<td>where various things came from</td>
</tr>
<tr>
<td>U</td>
<td>More</td>
<td>History of objects and how they came about</td>
</tr>
<tr>
<td>U</td>
<td>One Hour</td>
<td>Many things about the objects</td>
</tr>
</tbody>
</table>

Key

<table>
<thead>
<tr>
<th>Key</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-Graduate</td>
<td>PG</td>
</tr>
<tr>
<td>Tertiary</td>
<td>U</td>
</tr>
<tr>
<td>Secondary</td>
<td>S</td>
</tr>
<tr>
<td>Primary</td>
<td>P</td>
</tr>
</tbody>
</table>

4.6 Circulation consideration

4.6.1 Circulation patterns (plans showing patterns)

The researcher took photographs of circulation patterns that visitors followed in the museum. Then, each action was coded in three levels: Turning right; the tendency to walk on the right side of a path has been frequently observed and is closely tied to the tendency to turn right. A few visitors turned right when they walked in. Turning left; the majority of the visitors turned left from the main entrance. Walking straight up to a specific object; Walking straight from the main entrance of the path and directly to an iconic object was also observed but only a minority did that. This is shown in figure 17 below.
Figure 17 Circulation patterns chosen by museum visitors

(Author 2013)

Figure 18 Arrows showing the different patterns followed by visitors in Fort Jesus museum

<table>
<thead>
<tr>
<th>KEY</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue arrow</td>
<td>Visitors turned right</td>
</tr>
<tr>
<td>Red arrow</td>
<td>Visitors walked straight in to a certain object</td>
</tr>
<tr>
<td>Yellow arrow</td>
<td>Visitors turned left</td>
</tr>
</tbody>
</table>

4.6.2 Circulation Paths

The data shows that there was a tendency for visitors to move along only one side of the path through the exhibitions thus one-sided viewing. The distance from one side to
another and the amount of traffic flow strongly influenced crossing the path, only a minority was observed to have been criss-crossing. The number of visitors back tracking to see objects again was also not substantial. This is shown below in figure 19 below.

![Circulation paths](image)

**Figure 19 Circulation paths within the museums**

(Author 2013)

![Circulation paths within Fort Jesus museum](image)

**Figure 20 Circulation paths within Fort Jesus museum**

(Author 2013)

<table>
<thead>
<tr>
<th>KEY</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue arrow</td>
<td>Visitors criss crossing</td>
</tr>
<tr>
<td>Red arrow</td>
<td>Visitors with one sided viewing</td>
</tr>
<tr>
<td>Yellow arrow</td>
<td>Visitors who backtracked</td>
</tr>
</tbody>
</table>
The focus group discussions with exhibition designers on the topic of circulation patterns shed the following insight; right turning seems to occur in some conditions but not others. If the attraction of a landmark object is not considered, reducing the number of steps seems to be the major motivation for turning right. They suggested that, in the absence of other motivations (such as a destination to the left, or following a group of other people) people who are in the right lane of the path will turn right if it involves the fewest number of steps. If a person’s destination is to the left, they tend to move to the left side of the path before turning left. The nature of an exhibition dictates the pattern; if it is chronological then people follow a certain path. Sometimes exhibitions are thematic thus the theme is what will dictate the path followed by visitors to the museum.

4.7 Display of items
This set to find out if the visitors liked the general look and show of items in the museum. The figure 21 below shows the responses. Majority of the visitors liked the display but there were some who did not like the display in both museums.

![Respondents who liked the display](figure.jpg)

Figure 21 showing respondents like or dislike of the display

(Author 2013)
The question posed was as “Could you see all the objects clearly?” For the ones who answered in the negative way, they gave their reasons as shown in table 4.7.0-1 below.

**Table 4.7-0-1 Reasons for dislike of display**

<table>
<thead>
<tr>
<th>RESPONSES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>poor arrangement</td>
<td></td>
</tr>
<tr>
<td>poor design</td>
<td></td>
</tr>
<tr>
<td>poor lighting</td>
<td></td>
</tr>
<tr>
<td>too few objects</td>
<td></td>
</tr>
<tr>
<td>tiny objects</td>
<td></td>
</tr>
</tbody>
</table>

The focus group discussions with curators informed the researcher that there are different types of objects; small, big, fragile or ethnographic objects. This determines how the object will be displayed. Also conservation and security of the exhibits is a great consideration of displaying. It is also inferred that the display is dependent on the target audience and the resources that a particular museum has. It’s also dependent on the permanence of an exhibition. The story line is also another consideration for depicting the way an object is to be displayed.

### 4.7.1 What was appealing in the museum

The researcher wanted to find out what appealed to them in the museum and what they could remember most from the museum. From this data it is evident that people remember items that are well designed or had a certain interesting historical background.

**Table 4.7-0-2 The most memorable and appealing things**

<table>
<thead>
<tr>
<th>Responses</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pictorial view of Gede ruins</td>
<td>16</td>
</tr>
<tr>
<td>The diver</td>
<td>20</td>
</tr>
<tr>
<td>The Arab origin</td>
<td>7</td>
</tr>
<tr>
<td>The boat</td>
<td>22</td>
</tr>
<tr>
<td>The stamps</td>
<td>11</td>
</tr>
<tr>
<td>Buffalo horn</td>
<td>9</td>
</tr>
<tr>
<td>The drawings and the age of the Fort</td>
<td>7</td>
</tr>
<tr>
<td>The sunken ship</td>
<td>8</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
</tr>
</tbody>
</table>
Responses | Percentage
---|---
The pictures taken by Joy Adamson | 17
The Maasai circumcision knife | 23
The manyatta | 27
conservation | 33
TOTAL | 100

4.8 Suggestions

Some of the respondents made suggestions on how to improve the display of exhibits in the Museums. The results are shown in table 4.8.1 below.

Table 4.8-1 Suggestions by respondents

<table>
<thead>
<tr>
<th>Suggestions by respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 The Museum should be expanded to accommodate more items and people</td>
<td>17</td>
</tr>
<tr>
<td>2 The glass vitrines should be cleaned regularly</td>
<td>7</td>
</tr>
<tr>
<td>3 The museum should be advertised to attract more people</td>
<td>24</td>
</tr>
<tr>
<td>4 Color and other elements should be used for differentiation of parts</td>
<td>17</td>
</tr>
<tr>
<td>5 The museum should cater for a wider range of literacy i.e. using plain English</td>
<td>14</td>
</tr>
<tr>
<td>6 The museums should know their audiences</td>
<td>10</td>
</tr>
<tr>
<td>7 They should ensure that the museums are well lit and properly ventilated</td>
<td>10</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
</tr>
</tbody>
</table>

A majority of the respondents recommended that Narok Museum should be expanded in order to accommodate more items that form the Maasai culture. It seemed like it’s a very
small museum. The designers of the museum should use color and other elements to make the museum more beautiful. This would also assist in differentiating the different exhibits and also in orientation. Others were keen on the lighting and ventilation in the museum as they thought that the Fort Jesus museum did not have considerable amount of natural lighting.
CHAPTER FIVE

INTERPRETATION OF THE FINDINGS

5.1 Introduction
This chapter interprets the findings from the previous chapter in the order of; response rate in section 4.2, personal information in section 4.3, signage and text considerations in section 4.4, circulation patterns in section 4.6 and display considerations in section 4.7.

5.2 Interpretation of the findings
Section 4.2 describes the efficiency of the data collected as most of the questions were answered in the interview schedule with only a few respondents ignoring some of the questions. Though the methodology sought to have a balance in the male and female interviewees fewer women were interviewed. This is because there were more male than female visitors in both Museums. Therefore during the period of data collection fewer females visited the museums.

The results from the level of education section (4.3.1) showed that majority had a college diploma. Therefore their understanding of exhibitions and learning capabilities ought to be higher.

In section 4.3.4 the respondents gave various reasons for visiting museums’. Most of them came to learn others came for leisure and other came to explore. All these are purposes for which museums are developed. Exhibitions are environments in which interactions occur among visitors, objects, environment, and meaning. They are places of various experiences.

The data on signage and text considerations in section 4.4 showed that most respondents did not read all the labels and a few read all of them. This is because visitors must first pay attention to a label before it has any chance of delivering an interpretive message. One exhibit designer remarked that “the limitations of attention” prevent visitors from simultaneously attending to both label and objects. When given a choice, visitors look at objects rather than read labels. Since the focus of visitor attention is primarily on three-dimensional visual experiences, it follows that labels are most effective when they
complement the objects. They complement by focusing attention on important characteristics, or explaining phenomenon, or serving some other such function. The object in a museum may not speak for itself without the label.

The focus group discussions explained that the information found on the labels is basically the name of the object e.g. “Kiti cha Enzi”. At times if the object is a donation, or it was done by a certain archeologist then there is acknowledgement of this fact on the label. If a visitor is interested in more information then there are other ways of getting this information. Some respondents explained that some words were foreign and they did not understand them.

On the issue of paragraphs there is a set standard for museums in number of words to be included in a paragraph. This may explain the fact that most visitors found that the information was adequate.

The data in section 4.6 shows that majority of the respondents turned left when they walked into the museums. The researcher recognized that the design of the space determined whether or not left turning occurred when visitors entered the museum. There are two other factors that may also support choice of turning: crowding and modeling. When there were crowds of people, turning right required fighting the oncoming traffic. Turning left avoided this conflict. Modeling occurred when an individual or group was being led by a tour guide or they followed the person in front of them.

In the case of circulation paths the data showed that the majority chose to stick to one side of the exhibition. When exhibits or objects are displayed on both sides of a path, there is competition for visitor attention between the two sides and one or both sides have a lower rate of attention and/or approach. Visitors almost always chose a turning combination involving the least number of steps. To save steps, many visitors continued along one side. Very few backtracked to look at an exhibit a second time maybe because there was nothing interesting enough.

The focus group discussions unveiled that in every exhibit space, there are “hot” and “cold” spots of visitor attention which is at least partially influenced by the circulation patterns of visitors. A myriad of exhibit islands creates a chaotic traffic flow in which
some displays receive a high level of attention, and others receive a low level. When the flow is chaotic, visitors are more likely to miss a display unintentionally. If there is a clear pathway or order of viewing displays, each object is more likely to get attention.

In section 4.7, the respondents gave reasons for not liking the display. Majority liked the display. There are different types of display for example wall, periphery or island scenario these then determine from which direction an object will be viewed. From the focus group discussions with exhibition designers; it was discovered that exhibit/object design often tries to use the attracting power of the exhibit to draw the visitor. But this often failed as visitors chose the exhibits they wanted to see. They do not view exhibit linearly so linear stories created by designers and curators are undone. Even a forced route was frequently skipped. Sometimes the solution is with a guide. Some guides though do not seem to give correct or enough information when asked about certain exhibits. However the key element of an exhibit is not its attracting power but its ‘holding power’ so a visitor stays to read the label. This misinformation is frequent and often the result of the curator not including information a visitor might want i.e. showing relevance or not making a simple message explicit enough.

The focus group discussions with curators inform the study that their role was to interpret and present collections to be shown in museums. The curators said that most visitors deal with information on a concrete level rather than an abstract one. What is it? Compared with ‘how did it change the course of history?’ would be some of their reactions. Visitors spent most of their time to touching, feeling, looking, smelling – and not reading. A key role of curators in displaying objects is provision of both preventative and restorative conservation. This explains why not all objects can be exposed to either the vagaries of nature or to touch by visitors.

The focus group discussions also informed the researcher that it is not possible to tell the whole story of an exhibit but also the whole story can be told by use of several objects. It was also evident that museums are moving away from the old style of exhibit-label design into a multifaceted one whereby museums are inclusive of audio-visual displays, are participatory in that people can interact with objects and some objects even have sounds.
One of the challenges that face smaller museums in Kenya is that there are no professional curators and exhibition designers, the ones who are there just learn on the job. This maybe one of the contributions to the poor design of circulation patterns in especially Narok museum.

It was noted that visitors created their own experience – interacting and selecting exhibits, discussing them with each other. Not always the way that was intended. They seemed selective. Each visitors experience was different because they brought their own social and personal context with them. Some seemed just content with taking photographs with the exhibits.

5.3 Summary
This study aimed to establish whether the current display of artefacts in museum exhibitions was ideal for learning. An overwhelming number did not read all the labels in the museum even though they claimed to have visited the museum in order to learn. Visitors still chose their own paths though the museum had implied paths in terms of chronology. Over half of the respondents stated that they liked the display but it should improved to encompass design elements. Thus it can be concluded that design does have an impact in developing museums and exhibitions in Kenya.
CHAPTER SIX

SUMMARY OF THE FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

6.1 Introduction
The general objective of the study was to establish whether the current display of artefacts in museum exhibitions was ideal for learning. This chapter presents a summary of the findings, conclusions and recommendations.

6.2 Summary
While trying to establish whether the current display of artefacts in museum exhibitions is ideal for learning, the study found out the following; most of the respondents were residents of Kenya and they had a college certificate. 48% of the respondents are within the age range of 18-25, 24% within the range of 36-45, and 28% of respondents are within the age range of 26-35. Majority of the visitors to the museum said they had gone to learn which a function of museums is. On signage and text most respondents did not read all the labels in the exhibition and of those that they read most of them did not read all the information on it. Some reported that there were words which they did not understand though the labels were easy to read. Majority said the information on the paragraph was adequate to tell the story a few thought they were long and boring. Circulation paths and patterns were dependent on the architectural structure of the building. Most visitors turned left when they walked into the museum. A majority also stuck to one sided viewing in the museum and very few backtracked. Majority of the visitors liked the way the items were displayed but there were some who did not like the display in both museums.

Two obvious factors in capturing attention are the salience or distinctiveness of the label and the traffic flow patterns in the environment. The more salient the label, the more likely it will be noticed. Traffic flow also influences whether a label will be detected: labels in locations along the pathway taken by visitors have a higher chance of being seen than those not in the path (Mutile, 2013).
6.3 Recommendations

6.3.1 Signage and text

The study has established that majority of the people who visit the museum do not read all the labels given. Even the ones who read don’t read the whole paragraph. From the focus group discussions; the study recommends the following considerations for label design;

- That the active voice in text panels should be used in short sentences. Subject-verb-object sentence structure ensures better understanding. Sentence length should be no more than 25 words (15 is preferable). Label length should be a maximum of 75 to 100 words.
- A short overview paragraph at the beginning of introductory and thematic label panels should be provided.
- The designer should use typefaces that are readily legible. The typefaces that are easiest for people who have low vision, language problems, or cognitive disabilities are sans serif or simple serif
- The use of script and italic type for essential information need be avoided. Oblique type is, however, generally legible.
- Type size appropriate to the viewing distance should be selected. When distance is being calculated, the effects of crowds on actual viewing distance need be considered.
- Labels should be mounted so that visitors can get very close to read them. Label and location should be situated so that the reader does not block his own light.
- Label location should be out of the way of barriers, protruding objects, stairs, or the swing of a door.
- The natural line of sight should be considered when mounting labels.
- Labels ought to be located in consistent locations throughout an exhibition. Labels that appear in a different location at each work of art or within each case are difficult to find.
6.3.2 Circulation considerations

The study established that though the circulation pattern was implied by the museum, visitor agenda still took center stage on the paths followed. Though some of the following may be used to enhance circulation:

- The walls, floors, and pedestals need be visually defined. Some people with low vision have difficulty with depth perception. Color contrast and directed lighting can differentiate horizontal from vertical surfaces on paths.
- Design areas so that floor surfaces at and around accessible seating areas are level, stable, firm, and slip-resistant.
- An accessible floor plan should be provided to aid visitors in way finding. A floor plan that meets requirements for accessible printed and raised-line materials can assist people with visual impairments and cognitive disabilities to plan travel through complex exhibitions. These should be available at entries to exhibitions, information desks, and/or other central locations.
- Clear floor spaces (approximately 760 mm [30 in.] by 1220 mm [48 in.]) should be planned to allow a person using a wheelchair to either move parallel to the case and then proceed in a forward motion or to move perpendicular to a case and then back away easily.
- More than one exit from an exhibition should be provided. Mid-point exits from exhibitions (particularly large exhibitions) assist those who become tired, confused, or overwhelmed when in an exhibition.

6.3.3 Display considerations

The arrangement of objects within the environment determines how people will move through the environment. The study showed that a number of visitors found the museums too dark thus the display was not properly visible. The following are the recommendations from both the curators and Exhibition designers:

- Seating and wheelchair rest space should be provided just off the main circulation routes and evenly spaced throughout the exhibition. These would be ideal points for taking sketches or notes.
• Everything should be able to be viewed from wheelchair level.

• Visitors should be invited to touch open displays

• Displays should allow people with low vision to get their faces next to the screen.

• The designer should use a line length for text that facilitates reading. Text containing too many characters on a line is difficult to read.

6.4 Conclusion
The study established that male Kenyan locals constitute the largest percentage of the respondents. The study also showed that women are minority visitors to museums and that attracting female visitors is a challenge. It was found out that the majorities of respondents was college leavers touring their country for the purposes of learning about other cultures.

6.4.1 The role of circulation and display in developing museums
The first objective was to determine whether artefacts are correctly displayed. The researcher examined display in terms of circulation patterns and general placement of artefacts. How the visitors will walk within the gallery has been proven by the results a good indicator if learning will take place or not. Many labels may not be read because of the traffic flow. If visitors do not pass by a label they will obviously not give it attention. A myriad of exhibit islands creates a chaotic traffic flow in which some displays receive a high level of attention, and others receive a low level. When the flow is chaotic, visitors are more likely to miss a display unintentionally. If there is a clear pathway or order of viewing displays, each object is more likely to get attention. Consequently, understanding how visitors move through interpretive spaces is important when developing museums.

6.4.2 The role of labeling in developing museums
Objective two was to analyse labeling as applied in museums. The researcher concludes that the design of labels plays an important part as shown in the data collected. If averaged out reading labels lasted seconds. Many read parts of the label but not all of it. Most label reading is in the first 20-30 minutes of the visit. The visitors then become selective on reading labels that satisfy their curiosity. Visitor first looks at exhibits and
asks - what does it do or what is it. The visitor may check answer by reading the label. In some cases the answer the visitor wants isn’t in the label so they make it up. Visitors can more readily attend to the educational messages if the labels are designed to minimize mental effort, increase interest level, and help visitors focus their attention on easy-to-understand information.

6.4.3 Proposed attributes that may enhance learning

The third objective was to propose attributes that will enhance learning in the museum. The research at hand has come up with recommendations to help museum curators tell the story while considering the effects of proper design and exhibition designers to design effective labels and circulation patterns that will enhance learning. The proposed attributes are that:

- There should be sufficient viewing space for large objects, photographs, paintings etc by avoiding displaying them in a constrained environment where bottlenecks may occur.

- It will be beneficial to have interactive displays as they connect the visitor with the object thus they may learn more.

- Nonverbal way finding assistance along the circulation route should be provided. Color coding, changes in surface texture, symbols or other nonverbal techniques assist people with cognitive disabilities in finding their way through complex environments. Color contrast between carpet path and edge is also an effective way to define paths for people with low vision or cognitive disabilities.

- Sufficient lighting on circulation routes and on vitrines should be provided.

6.5 Suggestions for further research

In this study the researcher was particularly interested in two variables; signage and circulation patterns that influence the development of museums to aid learning. This is not an exhaustive list. One interesting area of inquiry is examining how color and lighting can influence the visitor’s ability to learn. In addition further study can be conducted to determine how meanings can be built and created through visual elements in exhibition
design. Further it is suggested that a study be conducted to establish the effect of the atmosphere in developing exhibitions and museums. The term atmosphere in this thesis means the overall feel that one gets when they visit the museum.
REFERENCES


Greeno, G. (1997). On claims that answer the wrong questions, Educational Researcher, 27 (1), 5-17


ICOM Statutes, adopted during the 21st General Conference in Vienna, Austria, in 2007:


Koran, J., Koran, M.L., & Longino, S. (1986). The relationships of age, sex, attention, and holding power with two types of science exhibits. Curator, 29(3), 227-244.


McLean, K. (2003). In the cave, Around the campfire, And at the well. Paper presented at the ICOM-CECA Annual Conference, Oaxaca


88
http://www.linezine.com/1/features/ewwslc.htm


Writing@csu is an open-access, educational Web site supported by Colorado State University. Copyright©1993-2012 Colorado State University Retrieved from http://writing.colostate.edu/guides/research/casestudy/pop2e.cfm


## APPENDIX I

### TIMEPLAN

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial preparation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Refining research topic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Literature search</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Problem analysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Interview schedule design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Contacting prospective interviewees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Pilot study</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Consultations with supervisor/s</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Field Work</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Photography</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Interviewing visitors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• FGDs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Analysis of collected data from photographs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Analysis of interview schedule data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Analysis</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Evaluation of results</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Writing of draft report</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Final Phase</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Finalizing of research report</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Presentation of final research report</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# APPENDIX II

## BUDGET PLAN

<table>
<thead>
<tr>
<th>Sn.</th>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Personnel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Per-diem for data gathering estimated 60days @ 1500</td>
<td>90,000</td>
</tr>
<tr>
<td></td>
<td>Purchase of essential books, journals and magazines</td>
<td>60,000</td>
</tr>
<tr>
<td></td>
<td>Internet services @ 1000 per month 48 months</td>
<td>48,000</td>
</tr>
<tr>
<td>2</td>
<td>Stationery</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Printing paper 15 rims @ 600 Kshs</td>
<td>9,000</td>
</tr>
<tr>
<td></td>
<td>Printing Ink Cartridges 10pcs of Black @ Kshs 1200/=</td>
<td>12,000</td>
</tr>
<tr>
<td></td>
<td>Printing Ink Cartridges 10pcs Tri color @ Kshs 1500/=</td>
<td>15,000</td>
</tr>
<tr>
<td>3</td>
<td>Equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Laptop Toshiba Satellite</td>
<td>60,000</td>
</tr>
<tr>
<td></td>
<td>HP printer DeskJet 5150 series</td>
<td>25,000</td>
</tr>
<tr>
<td></td>
<td>Scanner</td>
<td>20,000</td>
</tr>
<tr>
<td></td>
<td>Digital camera 8.5 mega pixel and 2GB memory</td>
<td>18,000</td>
</tr>
<tr>
<td></td>
<td>Camera carrying bag</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>Battery charger plus rechargeable batteries</td>
<td>2,000</td>
</tr>
<tr>
<td>4</td>
<td>Secretarial services</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Typing/ Photocopying</td>
<td>4,000</td>
</tr>
<tr>
<td></td>
<td>Editing</td>
<td>1,000</td>
</tr>
<tr>
<td></td>
<td>Binding</td>
<td>3,000</td>
</tr>
<tr>
<td></td>
<td><strong>Sub Total</strong></td>
<td><strong>372,500</strong></td>
</tr>
<tr>
<td>5</td>
<td>Miscellaneous expenses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>At 10% of the sub-total above</td>
<td>37,250</td>
</tr>
<tr>
<td></td>
<td><strong>Grand Total</strong></td>
<td><strong>Kshs 409,750</strong></td>
</tr>
</tbody>
</table>
APPENDIX III

DATA COLLECTION INSTRUMENTS

Interview Schedule

The researcher is a final year Master of Arts in Design student at The School of Arts and Design, University of Nairobi, seeking to investigate “The role of design in developing exhibition and display for museums in Kenya”. Kindly assist by responding to the questionnaire. The report will strictly be for scholarly purposes only.

Note: Some this ‘questions” are prompts only, not all questions should be read out verbatim

1. Which part of the country do you come from?
   ______________________________________

2. How often do you visit this Museum Fort Jesus / Narok?
   Once a year □  Twice a year □
   Thrice a year □  More than thrice □

3. Approximately how long have you spent in the museum?
   10 to 30 minutes □  1hour □  2hours □  More □

4. Why did u visit the museum?
   ______________________________________________

5. Did you like the display of objects there?
   YES □  NO □

6. Could you see all of the objects clearly?
   YES □  NO □
7. If question in 6 the answer is NO, give reason?  

_________________________________________________________________

8. Did you read all the labels?  
   YES [ ]  NO [ ]

9. Are the labels easy to read?  
   YES [ ]  NO [ ]

10. Were the paragraphs used for labeling enough?  
    YES [ ]  NO [ ]

11. Are there words that you did not understand?  
    YES [ ]  NO [ ]
    If yes, which words?  
   _________________________________________________________________

12. What did you learn from the labels?  
   _________________________________________________________________

13. Did you learn more from the objects or labels?  
   _________________________________________________________________

14. What do you find particularly attractive or appealing about the Museum?  
   _________________________________________________________________

15. What do you remember most, from the exhibition?  
   _________________________________________________________________

16. Are there any additional comments you would like to make, either about the Museum as a whole or a specific exhibit?  
   _________________________________________________________________

17. How old are you?  
   18 to 25 [ ]  25 to 35 [ ]  35 to 45 [ ]  46 to 60 [ ]  Over 60 [ ]

18. What is your level of education?  
   Primary [ ]  Secondary [ ]  college [ ]  Post graduate [ ]
Focus Group Discussion’s 15-20 minutes

Note: This are guides only, and should not be read out verbatim

Discussion guide for curators

- Display of artefacts in Kenya.
- Considerations for labeling.
- Considerations for circulation patterns in this museum.
- Effective way to tell a story visually.

Discussion guide for exhibition designers

- Display of artefacts in Kenya.
- Considerations for labeling in museums.
- Considerations for circulation patterns in this museum.
APPENDIX IV

Figure 22 Visitors with different agenda at Fort Jesus Museum (Source: Author 2013)

Figure 23 Stamps as an exhibit at Fort Jesus Museum (Source: Author 2013)
Figure 24 The diver in Fort Jesus Museum (Source: Author 2013)

Figure 25 Visitors with a tour guide following a chronological path as intended by the designers. (Source: Author 2013)
Figure 26 Display of china ware at Fort Jesus Museum (Source: Author 2013)

Figure 27 Labeling of items in Fort Jesus Museum (Source: Author 2013)
Figure 28 Fort Jesus Museum circulation paths taken by different visitors (Source: Author 2013)

Figure 29 Visitors walking in and turning left in Fort Jesus Museum (Source: Author 2013)
Figure 30 Gourds that were used for preservation by the Maa (Source: Author 2013)

Figure 31 Visitors looking at different items in Narok Museum and the different paths taken by visitors (Source: Author 2013)
Figure 32 Paintings on walls of Narok Museum (Source: Author 2013)

Figure 33 Spears that the Maasai would place outside the home when they arrived and a stool for sitting on (Source: Author 2013)

Figure 34 Manyatta and mural on the wall in Narok Museum (Source: Author 2013)
Figure 35 Narok Museum vitrine placed near a window (Source: Author 2013)

Figure 36 Narok Museum showing arrangement of cabinet (Source: Author 2013)