ADAPTING INTERNATIONAL SYSTEM OF TYPOGRAPHIC AND PICTURE EDUCATION (ISOTYPE) WAY-FINDING DESIGN IN THE JOS METROPOLIS

BY

Sunday Saje GYANG(B.A. HONS. ABU 1990)
P13EVID8025

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NIGERIA

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DECLARATION

I declare that the work in this thesis titled“Adapting International System Of Typographic and Picture Education (ISOTYPE) Way-Finding Design in the Jos Metropolis”has been carried out by me in the Department of Industrial Design. The information derived from the literature has been duly acknowledged in the text and a list ofreferences provided. No part of this thesis was previously presented for another degree or diploma at this or any other institution.

……

Sunday Saje GYANG

……

Date

CERTIFICATION

This thesis titled ADAPTING THE INTERNATIONAL SYSTEM OF TYPOGRAPHIC AND PICTURE EDUCATION (ISOTYPE) WAY-FINDING DESIGN IN THE JOS METROPOLISby Sunday Saje GYANGmeets the regulations governing the award of the degree of Master of Arts (Industrial Design)of the Ahmadu Bello University, and is approved for its contributions to knowledge and literary presentation.

Sunday Saje Gyang ……..…….....
Signature Date

Prof. J. M. Yakubu, ……..……...….
Chairman, Supervisory Committee, Signature Date
Department of Industrial Design,
Ahmadu Bello University, Zaria.

Dr. S. U. Dakyes, ……...……...
Member, Supervisory Committee, Signature Date
Department of Industrial Design,
Ahmadu Bello University, Zaria.

Dr. Vershima Alkali, ……..…..……...
(Head of Department) Signature Date
Department of Industrial Design,
Ahmadu Bello University, Zaria.

Prof. Kabir Bala,……..……
Dean, Postgraduate School, Signature Date
Ahmadu Bello University, Zaria.

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ABSTRACT

The renewed attempt by the Plateau State Government to further review the implementation of the Greater Jos Master Plan has made the opportunity for the inclusion of appropriate way-finding signs in to the entire design process imperative. This has given rise to this study, which is to determine whether the some existing Directional Signs in Jos metropolis conform to ISOTYPE **(International System Of TYpographic Picture Education).** ISOTYPEis a concept developed by Otto Neurath as a system of combining written text and symbols for effective communication at all levels of literacy. A total of 150 non literate and 132 literate persons and ten existing Directional Signs were selected using stratified random sampling procedure constituted the population of the study. A combination of survey and experimental design methods were used for the study. Questionnaires administered in interview sessions were used for data collection. Furthermore, symbol recognition test was administered to the respondents and the findings were used in redesigning directional signs for Jos metropolis. The results revealed that 88% of non-literate and 98% of literate respondents correctly identified symbols; only 10% of DS combined text and symbol, 30% symbol only, while 60% were text only. The study recommends combination of text and symbol as DS, and proper testing and education of symbols before putting them to use.

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DEFINITION OF TERMS AND ABBREVIATIONS AND ACRONYMS

Debabelization: The development of an international language that will communicate across cultures.

Directional Signpost: Signboard that is placed in strategic location to direct the public

DS: Directional Sign

Literate: Ability to read and write English

Non-Literate: Inability to read and write English

ISOTYPE: International System for Typographic and Picture Education.

Way-finding Design: The art of designing signs post to show direction to places

Chapter1.INTRODUCTION

Long before paper was invented, humans made marks on objects, such as cave walls, rocks, trees and other objects in their surroundings. The purpose of making these marks or signs was to communicate information visually (SEGD 2005),this may have been for different purposes, including the need for some sort of direction, safe shelter or a productive huntingexpedition.



Plate I: *An early cave painting. Source: www.alifetimeofcolor.com*

The firstrecorded directional signs were milestones on the Roman road network. Large stones were placed at intervals along the roads, giving the distance in Roman miles to nearby cities.Because of their communication intents, these signs were imbued with meaning and became a shared language among the people who made and used them (Niron 2009).

As civilisation set in, cities became more complex, which gave rise to the need for information and easy navigation within the cities. Thus, the need for proactive, systematically planned, visually unified communication system for societal development arose (Arthur and Passini1992).In the 21st century, a great deal of information can be accessed with less effort, through television, radio, internet and telephone. Morellup, (2005) however, observed that the world is progressively suffering from information overload. It therefore, follows that simplicity in information presentation is one of the several waysof facilitating good decision-making in a world that is fast becoming a global village. The concern raised by Morellup has given rise to the need to develop an international language that will communicate intended information concisely across to as many people as possible, within a very short time, irrespective of language and literacy levels.

Otto Neurath in the early 1924 simplified important public information so that people could easily comprehendwhat was being communicated across cultures. After the Second World War, Neurath, an Austrian mathematician, philosopher, and social critic, sought to create ways to *empower and educate* the working class on important economic and social issues in order to better their lives. He envisaged a socially emancipated life made possible by public information(Tufte 2001).

Leading a group of artists, statisticians and researchers, Neurathdeveloped a system for the pictorial representation of statistical information for easy understanding. Neurath and his team named the system ISOTYPE (International System of TYpographic Picture Education).The basic principle behind the system was the use of written text and

graphic symbols to represent or give quantitative and qualitative information for public use. This would make information available to as many people as possible, within a very short time. The goal of ISOTYPE was to be an *"international picture language",* a universal graphic vocabulary accessible to people of all languages and levels of literacy. The use of text and symbols was intended to be easily translated, transcending linguistic boundaries. "We have made one international picture language (as a helping language) into which statements may be put from all the normal languages of the earth. We have given it the name ISOTYPE", (Tufte 2001).

Neurath believed that as the world was preparing for the future, the gap between the educated and uneducated must be filled. A good way to bridge the gap would be through ISOTYPE, a method with a special visual dictionary and a special visual grammar; that is, a new visual world, equivalent to our word world. Charts, pictures, models, movies, games, illustrations can, with a little related text, show in the symbol language the main facts and explain the important problems in any field of knowledge.

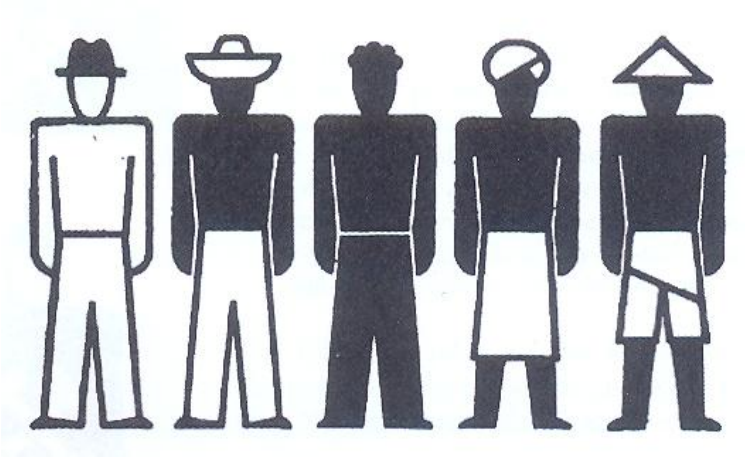


Plate II:*Symbols of different human races (Tufte 2001)*

With international business and connection, many cities in the world now use directional signsthat combine text and symbols. These directional signsare commonly seen at public places like airports, motor parks, filling stations, post offices, hospitals, hotels, train stations and tourists sites.



Plate III: *Directional Signs at an Airport. Source: www.designworkplan.com*

The aim is to allow people to access important public information with less effort, irrespective of language and literacy.The text messages are written in the spoken languages of the environment, while the symbols on the other hand, are the pictorial representation of the written text, and can easily be comprehended, because they are illustrations of familiar objects that are commonly used in daily life. For example a silhouette of a person lying down on bed symbolises a hotel. It is called way-finding design (Gibson 2009).



Plate IV: *directional sign of a hotel, Source: Researcher's Construct*

Adaption and application of ISOTYPE in urban centres in Nigeria can be beneficial, particularly in a city like Jos, where the few directional signs (DS), as observed by this research, do not combinewritten text and graphic symbols.Because ISOTYPEhelps to communicate meaningful information via the combination of words and symbolsas directional signs, this will not only communicate the desired information across, but also enhance the status of the city as a tourist haven. The inclusion of tourism as one of the Plateau State Government "10-Point Agenda"calls forthe need to make way-finding for the visitors and residents of Jos stress free(Plateau State 4-Year Strategic Plan 2008-2012).

Asthe Plateau State Government revises the Greater Jos Master Plan, there is the need to carefully consider the importance of incorporating ISOTYPE into the plan. This will go a long way in aiding both the literate and non-literate persons to locate their destination with less effort.

1.2.Background of the Study

Jos is the capital of Plateau State, located at the central part of Nigeria. The origin of Jos as an urban centre can be traced to the tin mining industry founded during the colonial rulein 1902. By 1914 Jos became the centre of tin mining, mainly because of large deposits of tin that were discovered there, andbecause there wasa lot of land and water (Jacobs 1996).

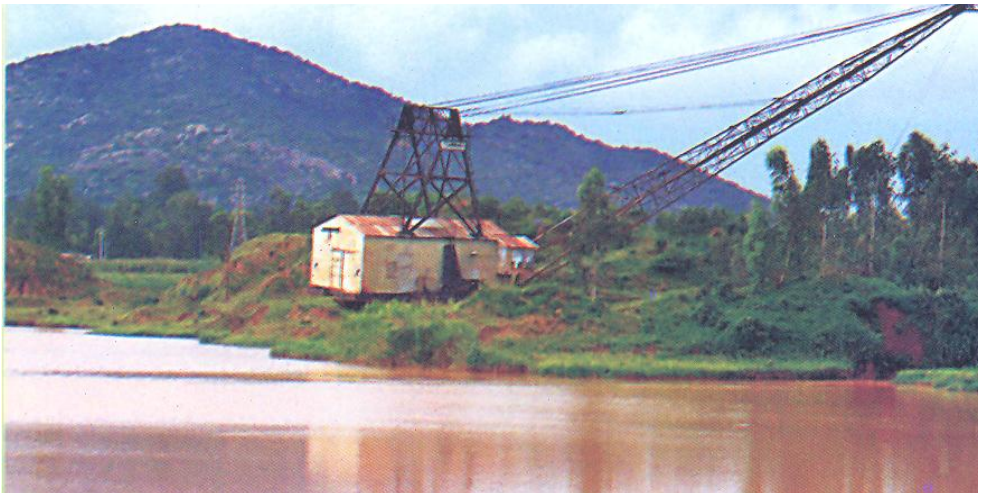


Plate V:*Amining site in BarkinLadi L.G.A. Source: Plateau the Beautiful Magazine*

In 1915, the colonial administration granted Jos the status of a second-class township. This led to the division of the town into clusters, in line with the typical colonial fashion of designing cities. This division granted the new settlers access to land in Jos, and they all contributed to the growth of the economy of the township in numerous ways. Jos grew very rapidly after the early layout. There was massive infrastructural development put in place by the Colonial Government, which attracted technical hands and people engaged in commercial and other related pursuits. The economic, commercial, and political significance of Jos continued to expand both during the Colonial period and beyond independence in 1960 (Pwajok 2012).

After independence, the then Military Government of Benue Plateau State, under Police Commissioner, Joseph DeshiGomwalk in 1972, designed a new Jos Master Plan.The Master Plan provides for the development of residential areas, road networks, industrial areas, and, most especially, developing the tourism potentials that abound in the state. This in turn will attractinvestors and tourists, thereby enhancing economic activity in

Jos, and the state as a whole (FolaKonsult 2008). Subsequent administrations, however, did not continue with the implementation of the plan. This has led to a lot of uncontrolled physical development, which doesnot conform to the master plan, making the Jos metropolis congested and, consequently, making wayfinding difficult, especially for visitors.

The need to revisit the Jos Master Plan became imperative. In 2007, the Plateau State Government, under the leadership of Governor Jonah David Jang revised the master plan for the city of Jos. The master plan was expanded to cover Jos North, Jos South, Bassa, Riyom and BarlinLadi Local Government Areas; it was also renamed "The Greater Jos Master Plan", with an implementation period of 18 years, starting from 2008 to 2025(FolaKonsult 2008).

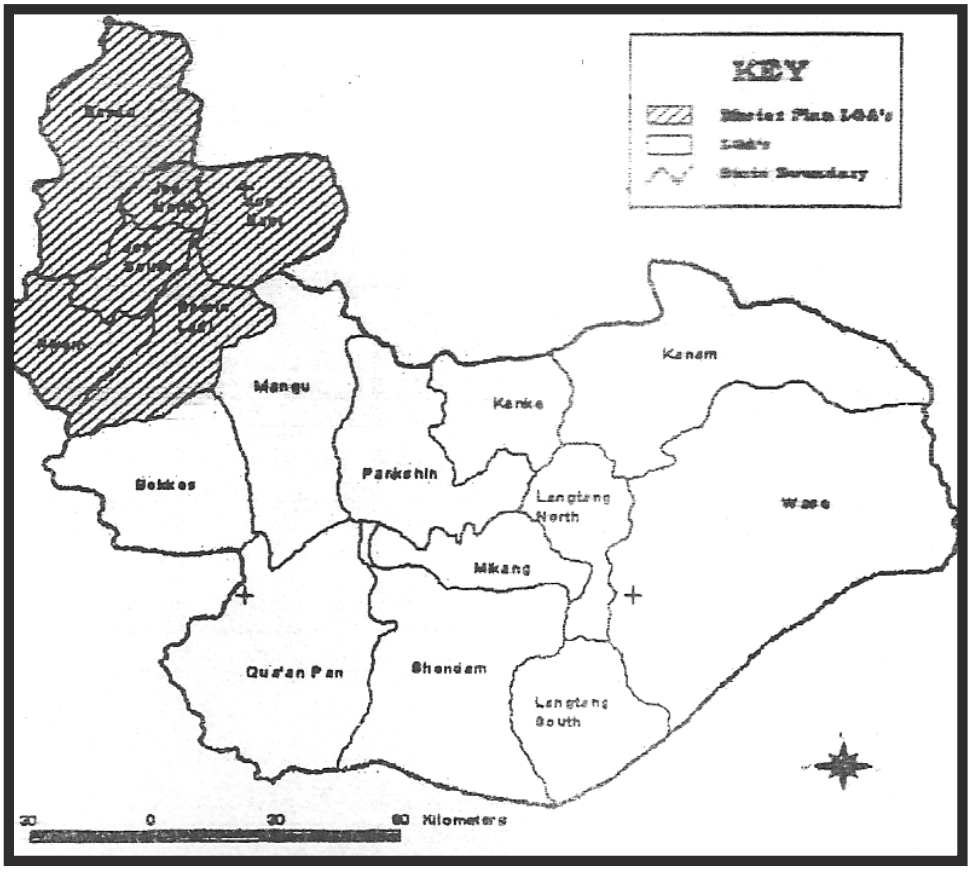


Plate VI: *A map of Plateau State, showing the six LGAs that covers the Greater Jos Master Plan Area. Source: Plateau State Ministry of Urban Planning, Jos*

1.3.Statement of the Problem

The first post–colonial Master Plan for the city of Jos was designed by The Joseph DeshiGomwalk-led Administration of Benue Plateau State in 1972. Subsequent administrations did not adhereto its implementation plan. This gave rise to an uncontrolled physical development within the Jos metropolis, and resulted in the distortion of the plan, making way-finding very difficult. Furthermore, observations that informed this research suggested that the few directional signs (DS) within the Jos Metropolis do not seem to conform toISOTYPE standards and norms. The designers of these DS did not combine written text and graphic symbols on most of them. Consequently, some of the DSmay not be performing their communication function effectively, especially to those who cannot read the "text-only" messages. Therefore, it is desirable to evaluate/determine the communication effect of the existing DS in Jos metropolis now that the Plateau state Government is revisiting the Jos master plan so as to properly adapt the concept of ISOTYPE in the plan.

1.4. Objectives of the Study

The objectives of this study are to:

i. determine the effectiveness of directional signs within the Jos metropolis that conform to ISOTYPE standards in communicating intended public information to all, irrespective of language and literacy levels.
ii. determine whether the existing directional signs within the Jos metropolis conform to ISOTYPE norms and standards.

iii. propose the development of a non-verbal communication system as DS for Jos metropolis using ISOTYPE standards.

1.5. Basic Assumption of the Study

It is the assumption of this researcher that the combination ofwritten text and graphic symbols as DS in Jos metropolis, will effectively communicate intended information to more people, irrespective of their language and literacy levels than text only and symbol only.

Consequently, research questions were constructed to allow for a generalised conclusion to be made.

1.6.Research Questions

To carry out this study, some basic questions that willdetermine the effectiveness of directional signs (DS)in Jos metropolis must be asked. Such questions include:

(i) Do the existing directional signs within the Jos metropolis conform to ISOTYPE standards and norms?

(ii) Would directional signs in Jos metropolis that conform to ISOTYPE standards be effective in communicating intended public information to all, irrespective of language and literacy levels?

1.7. Hypothesis of the Study

There is no significant difference between DS that combine text and symbol in performing its communication function and those that do not.

1.8. Significance of the Study

The conducive weather of Jos, among other factors, attracts tourism and migration of people from all over Nigeria, West Africa, and many parts of the world, giving rise to an influx of population in Jos metropolis. In order to ease the flow of movement in the area, DS in Jos metro need to conform to ISOTYPE standards.

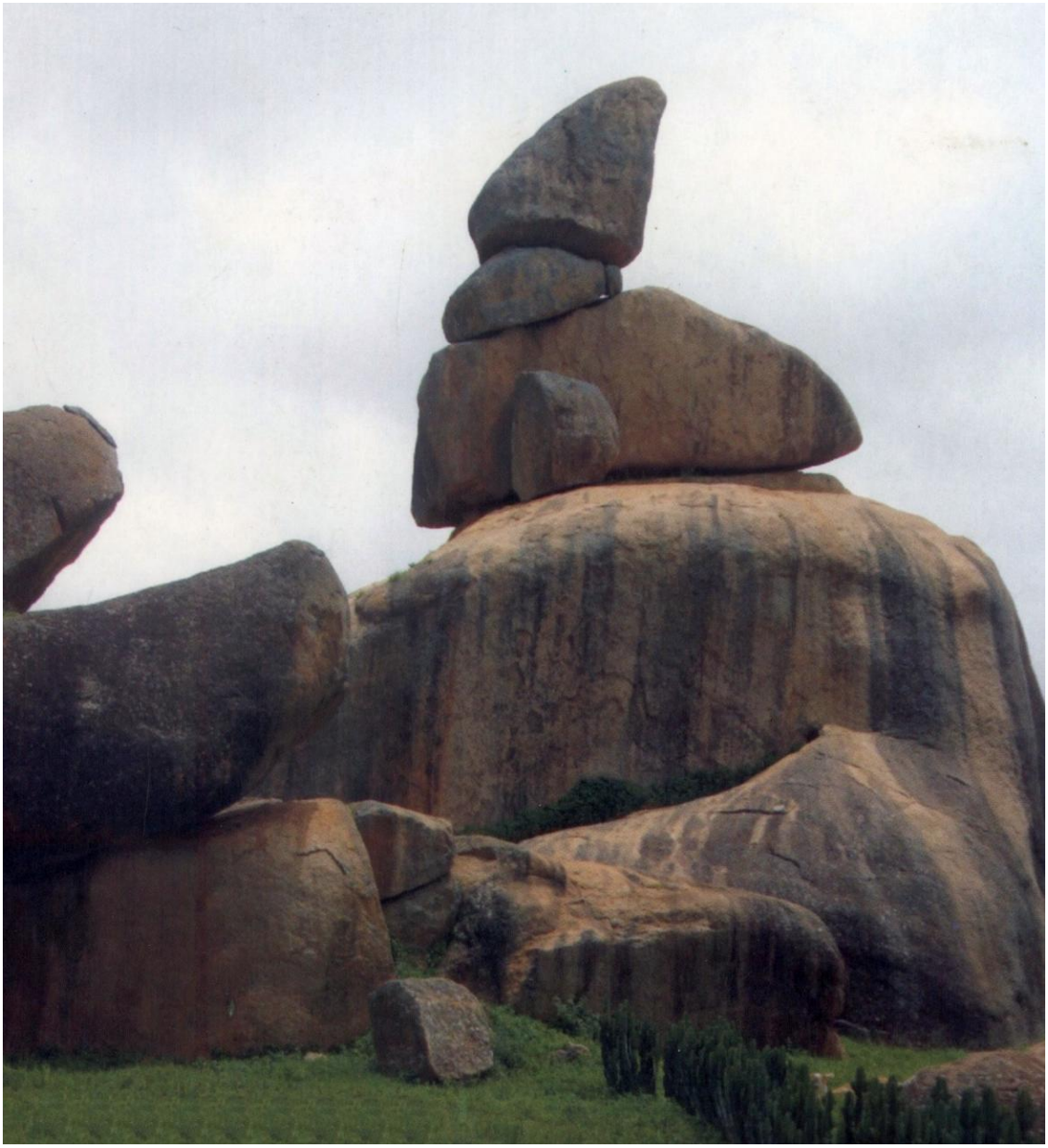


Plate VII:*The Riyom Rock, a tourist site in Jos. Source: Plateau the Beautiful Magazine*

1.9.Justification of the Study

Lynch, in his work Image of a city cited by Arthur and Passini 1992, affirmed that way-finding design is an integral part of any urban metropolitan design;theaim of such way-finding design in a city is to serve as directional guides for easy movement, thereby making public places and services accessible to all, with less effort.Combining written text and graphic symbols on directional signs for public places will not only fulfill the communication function of informing and directing visitors in a new environment, but will also enhance the beauty of the city. A friend of the researcher was able to get some foreigners working with a road construction company to fill some of the questionnaire, and did the symbol identification skill test. This was interesting because even though they were literate, they could not read English. Their ability to identify and recognised these symbols correctly has greatly added the needed impetus to this research.

1.10. Scope and Delimitation of the Study

This research is restricted to the use of DS in public facilities such as motor parks, hotels, hospitals, and airport. It is also narrowed to the combination of written text and graphic symbols as DS, with the aim of communicating intended information to the public in Jos metropolis. While DS in this study are strictly way-finding signs that are meant to help people in accessing public facilities with less effort, as against traffic signs that are for car and road users, billboards for the advertisement of services and

products, mostly for commercial reasons, and signboards that are mostly for private businesses.

1.11. Limitation of the Study

This study intended to record at least five of the existing DS in each of the six local government areas that covered the Greater Jos Metropolis, but only a total of ten DS in all were randomly recorded. This was because of the massive road construction in the area of study that led to the removal of some of the DS.Six hundred questionnaires were to be administered, but because of the security challenges,some places could not be accessed, onlythree hundred questionnaires were administered to respondents. The ethno-religious crisis also affected the timeframe and free distribution of questionnaire as planned by the researcher. For example, the Bauchi Road/AngwanRogo area was considered to be very volatile, the researcher had to employ the use of another set of research assistants who are residing around the these areas. As a result, not all of the literate respondents filled questionnaires could not be retrieved.

1.12. Theoretical Framework

The impetus of this study was based on the concept of ISOTYPE by Otto Neurath (Tufte 2001) andCollins, *et al* as stated by Niron 2009. Neurath founded ISOTYPE (International System OfTYpographic Picture Education).Neurath advocatedfor the combination of typography (texts) and Pictures (graphic symbols) in public information dissemination.

Large information reduced into brief text and symbols,when displayed as public information, will educate and inform the non-literate and literate audiencesacrosscultures. This conventionis now commonly used at airports, hotels, hospitals, public places, to communicateintended public information easily, to as many people as possible with less effort.Collins, *et al* in Niron(2009), tested safety symbols intended for a public building in America. Theyused symbols to indicate escape routes, from hotel, old people's houses and university hostels. More than 75% of respondents misunderstood five out of the seven symbols. They recommended that symbols for use in public places should be properly tested before they are put in use.Adapting the combination of text and graphic symbols for DS in Jos metropolis can be said to effective in communicating public information to all, irrespective of language and literacy levels, but such symbols should be properly tested before putting them to use.

Chapter 2.REVIEW OF RELATED LITERATURE

2.1.Overview of the Review Process

The aim of the literature review is to give a good understanding of published material in this field of knowledge (Toncich2006), so that critical decisions regarding the effectiveness of combining text and graphic symbols on directional signscould be made, especially for Jos city.Numerous texts, journal publications, and internet-sourced publications were examined. The review is based on the following subjects: Graphic Communication Elements such as signs, symbols andicons; typography (letters) and colour, perception of symbols, cross-cultural perception of symbols, studies on visual literacy, the significance, benefits of visual literacy, and the need to learn and understand visuals as represented in Niron 2009, and lastly, the concept of ISOTYPE(Tufte 2001); Way-finding(Gibson 2009) and the Greater Jos Master plan were all reviewed.

2.2.Graphic Communication

Communication is the exchange of information and ideas from a source to a receiver. This process involves the transmission of a message by a communicant, using appropriate medium or channel for the message, to a receiver who is expected to respond to the message by way of feedback.As a two-way process, the primary function of communication is to convey facts and ideas to people and to receive feedback(Orewere, 2006).

Graphic is the process of communicating ideas and facts with graphic design products such as in the print and non-print (electronic) media. Graphic communication therefore, is using graphicsto communicate.Graphic communication can also be defined as a deliberate art of conveyinginformation across by means of types and visuals(Banjoko 2009).

2.2.1.Signs, Symbols, and Icons in the Study of Symbols

There has been much disagreement over the nature, meaning and definition of symbolsSemiotic studies have considered sign to be the more encompassing term, subsuming symbols, signals, indexes and icons(Sewell,1994). Most objects, mark, events, models or pictures that serve as bearers of extractable knowledge are symbols and that symbols serve as characters or coding elements, symbols represent both signs and icons(Phillip,1995).

Dzobo (2009) sees symbol as a vehicle for the conception of an object, enabling us to conceive or form a view of an object; it calls forth mental images. For example, some indigenous African symbols and the conceptions they evoke in the mind are elephant for power, kingship; a lion symbolizes ferocity, danger and regally; women represent peace, productivity, creativity, life and growth.

Signs, symbols, icon and pictograms are very important in information design. Studies have shown that plenty of information can be summarised into a symbol, thus making it easier for people from different cultures to see and comprehend. There is however, the need toeducate the public properly, on their meaning before they are put into use, especially in multicultural society like Jos.

2.2.2. The use of Typography (Text)

Typography is the appearance of printed characters on any printed material. It is also the art of arranging text for the purpose of printing. Originally, type is the mechanical medium by means of which written matter was composed and transferred onto paper by printing. Each piece of type was carefully cut out of metal in relief form for each of the character of the alphabet.



Plate VIII:*Letters of the Alphabet, lower and upper cases. Researcher's construct*

Lines of type were arranged, inked, and positioned on a printing press that presses the type against paper or like material, leaving readable impression. Although the heyday of metal type and relief printing is long past, the term *type* is still used to describe a printing character regardless of how it is stored—on metal, film, or magnetic tape, or as a series of mathematical formulas in a computer (Microsoft Encarta 2009).

The practice of relief printing was already known in ancient times—stamps and seals, for example. In the middle of the 15th century, however, a reliable technology was perfected for the manufacture of individual or movable pieces of type. Although rudimentary typecasting techniques had been developed in China and Korea as early as the 14th century, credit for perfecting a reliable technology is generally ascribed to a German printer, Johannes Gutenberg. Between 1450 and 1456, when his famous 42-line Bible was completed(Wheildon, 1995).

The process of making type was slow and laborious, but once cast, type could be set and printed repeatedly, before it become too worn to produce sharply defined images. For more than 400 years all type was made by this means. The trade of manufacturing metal type came to be known as type founding (Microsoft Encarta 2009). Since Johannes Gutenberg perfected the art of printing, the introduction of electronic publishing has been very dramatic. Type, once cast as individual pieces of metal, is now computer-stored and generated by high-speed laser technology. Typeface design, once modelled on handwritten scripts, is now subject to electronic manipulations, and would shock Gutenberg and his contemporaries both technically and aesthetically (Craig, 1993).

2.2.2.1. *Readability and Legibility of typography (text)*

Readability refers to types as it is set, and deals with typeface selection, size, spacing, column measure, leading and other page layout characteristics. Legibility is an attribute of the type and refers to the ease with which we can recognise a character or distinguish it from another. It is the role of the typographer to understand characteristics that affect

readability, especially negatively Carter (1993). Carter also states that the use of typography should consider the following:

a. Who is the intended reader of your message (age, socio-economic background, educational level?)
b. What are they reading? What is the content and difficulty of the material?
c. How much are they reading? Is it long, short, brief, extensive?
d. When are they reading? On the train, at work, during leisure time?
e. Why are they reading? Pleasure, business?

With all the current emphasis on technologies, one needs to be constantly reminded that typography is still an essential and powerful force for increasing communication effectiveness. Typography need not only be visible and legible, it also needs to be felt and experienced. Phillip (1995) believes that typography lives its own aesthetic life next to its functionality. It carries the message we get from letters put together to form words, and words put together to form sentences.

The written word is generally seen before it is read. Typographical layout sets the mood before a single word enters consciousness. Type not only sets the stage for words message, but also becomes the message. Type can explain an idea and visually become the idea. Designers use typography not only to inform, but also to express. Typography or Typeface, if used appropriately, can express power, sensitively, anger. It can also make information more attractive (Wheildon, 1995).

2.3. The Use of Colour

Colour is more boldly and freely used today, than ever before. This is because colour affects our emotions, thoughts, and convey mood, from delight to despair, it can also be subtle or dramatic, and it captures attention and stimulates desire. Studies however, have shown that the impact of colour on people solely depends on individuals and to some extent, cultural background(Kaya and Epp, 2004).



Plate IX: *Colour wheel. Source: www.colourwheel.com*

2.3.1. *Colour Symbolism*

Individuals response to colourdifferently, most people, however, are influenced by either their past association with colour or cultural background. For example, in the western world where most adults drive cars, they are familiar with the stop and go lights. There is an automatic association of red with “stop”, green with “go”. In other parts of the world, such clear-cut association does not exist (Kaya and Epp, 2004).

In representational design, according to Niron 2009, there are basically two opposite ways of using colours; the “local” colour and the “expressive” colour. The local colour is the colour that seems to appear on an object when viewed under average lighting conditions. The average colour that seems to appear for example, on the leaves of a tree is green; green could therefore be the local colour of the leaves, as the case may be. But when such leaves are closely examined, many other colours can be perceived across the surface of leaves, local colour can however be said to be deceptive. At the other extreme is the expressionistic use of colour. This is when colours are used to express feelings without necessarily representing the visual truth of such a colour. Such expressionistic use of colour is open to individual interpretations.

The use of colour in the information art is according to Evans, (1959) and Faber, (1978), cited by Niron (2009), centred mainly on the constructive and expressive aspects of colour. The colour in use should have the potential of translating the visual impression of the intended message to the external world, and ithas to be a vehicle for the world of symbolic imagery.

2.4.Perception of Symbols

Before visual connection between a symbol and referent can be perceived, perception of the symbol must take place. A lot has been written about visual perception of pictorial materials (Bloomer, 1990). The first step in the perception of a symbol is for the observer to realize that the markings on the surface he is viewing mean something. Accordingly, the viewer must distinguish figure from background, and finally must understand that what he sees represents something in the real world. In other words, the observer must grasp the representational nature of the patterns he perceives.

If the observer perceives the symbol as visually similar to its referent, he will independently guess the target label. If the observer does not perceive a strong visual similarity, he follows one or two routes, he either fails to identify the symbol, or he utilizes skills learned from previous experiences with symbols to arbitrarily assign a label to the symbol. It seems that the observer, rather than the symbol, determines success on the iconicity task. If the viewer does not perceive a strong visual similarity between symbol and referent and cannot assign a label on the grounds of previous experience, the symbol is obscure to the individual, despite how other individuals perceive it (Fullerand Lloyd, 1991).

Furthermore, if the observer obtains the necessary experience, he might very well be able to later on assign a label to the very same symbol. The case of the medical student learning to deduce X-rayis a good exampleDeregowski, cited in study by Fuller and Lloyed (1991). On the first encounter with the X-ray plate, the medical student probably will not be able to perceive the meaning of the marks on the surface, so that the X-ray

could be considered obscured. After exposure to X-rays and training in interpretation, the student manages to assign meaning to the very same X-ray plate, so that the plate would now be considered iconic. Indeed, it appears that iconicity is in the eye of the beholder and not in the strokes of the picture.

2.4.1. Influences on the Perception of Symbols

If the perception of symbols is strongly influenced by the beholder, it is important to look at some of the factors that may influence the beholder's ability to interpret symbols. Some of these factors include the material on which symbols are printed,knowledge acquired through schooling,previous experiences with symbols, thinking styles, literacy levels and culture, as represented in study by Basson(2004).

2.4.2. Material on which Symbols are Printed

The material on which symbols are printed seems to play an important role on some Northern Nigerian boys. They were unable to identify familiar figures on paper, but could identify these same figures presented in carvings or on native leatherwork. Some members of an Ethiopian tribe could recognise the pictures printed on a crude cloth, a material which they knew; yet when the same pictures were printed on paper, a material unknown to them, they tasted and smelled the paper and did not recognise the pictures. In this instance, perception was hampered by the use of an unknown material.

2.4.3. Knowledge acquired through Schooling

In another study carried out, human figure drawing of schooled and unschooled children in Papua New Guinea were compared. It was found that the figures drawn by children who had attended school were more urbane than figures drawn by children who came from a remote area with no tradition of graphic art background and had not attended school. The result showed that school provided contact with drawing and opportunities to draw, which could aid the development of drawing in children. Although this was a drawing task, schooling helps children to develop skills in categorization, analysis and synthesis.Schooling further makes children aware that a sign/symbol can stand for or represent.

2.4.4. Previous experiences with symbols

The development of pictorial perception ability could be due to the influence of school (as stated above) or to extra-school cultural factors, or to both. This study as represented by Basson 2004, found a definite correlation between the ability of Bantu groups to interpret Western style pictorial material and the degree of acculturation to western culture made. Groups acculturated more to Western mode will have had more experience with Western symbols.

2.4.5. Thinking Styles in the study of symbols

The term thinking styles refers to the consistent, characteristic mode of functioning that pervades the perceptual and intellectual activities of an individual.One of the theories relating to thinking style is Witkin's cited in Taylor (1994), Taylor,*et al*(1994) concept of field-dependence and field-independence. It postulates that field-independent

individuals (typically from European and Asian groups) analyse information and pay great attention to detail, while Field-dependent individuals, like those from African, African-American and Hispanic groups, view information in relation to the context in which it is presented. According to these authors, the way a person sees and thinks about the world around him will influence the way in which he sees and interprets a picture.

2.4.6. Literacy levels in symbols identification

Before the advent of literacy in the old Greek civilization, all information had to be memorized for it to survive, since there was no means of recording it efficiently and unambiguously. This led to the development of an oral style, rich in rhythmic and metrical patterns, primarily for preservation purposes. It is argued that these attempts at remembering information led to distinct ways of thinking. Scholars describe several characteristics of such orally based thought, and make it clear that these apply to primary oral cultures, cultures that are wholly untouched by literacy. Such cultures even though are rare today, could hardly associate symbols to their referent easily. But through the widespread use of instruments like television, telephone and even radio, most *"oral"* cultures today have had some form of contact with writing, resulting in secondary orality. Furthermore, a literate communication partner can read the gloss that accompanies a symbol, but an illiterate partner has to rely on the transparency of the symbol to guess its meaning (Basson, 2004).

2.4.7. Culture of individuals in the perception of symbols

It is evident that all of the factors that influence perceptionof symbol are in turn, influenced by culture. Taylor and Clarke (1994) circumscribe culture as "a set of behaviours, institutions, beliefs, technologies and values invented and passed on by a group of individuals to sustain what they believe to be a high quality of life and to negotiate their environment". In short, culture is… *"a perceptually shared reality of world view"* (Bloomer, 1990). Thus, it is accurate to assert that culture influences every thought process and action of human beings. Culture undeniably dictates to a significant extent, the materials an individual is familiar with, whether the individual attends school or not, what thinking style he utilizes, whether he is literate or not, and whether he has had previous experiences with symbols or not. It seems that culture will have an overwhelming influence in the perception of symbols.

2.5.Cross-Cultural Perception of Symbols

Cross-cultural studies and visual images carry a consistent message – images are powerful, they are not just art, they are used to represent certain cultures (Nash, 1990). People respond to images in an active way, based on the circumstance of social activities, beliefs and concerns (Trevsky 1991). Many studies investigating cross–cultural designs reveal a consistent outcome: People from different cultures interpret and perceive visual images differently. Moriarty and Rohe (1992) did a study on cross-cultural design; the outcome shows a lack of cultural understanding and sensitivity in design students. Griffin and Gibbs's (1993) research on the interpretation of symbols concluded that there is cultural and social difference in how people recognize images. Zirkel and Greene as cited in Basson 2004, measured cultural attitudes towards visual

images among three different cultures and the results indicate differences in the perception of images.

2.6.Visual Literacy

Visual communication is a process of sending and receiving messages using images. Visual literacy can therefore be defined as the "ability to construct meaning from visual images" (Giorgis,*el al,* 1999). To make meaning from images, the reader uses the critical skills of exploration, analysis and reflection. Lapp,*et al* (1999) uses the term "*intermediality"* to describe the combined illiteracies needed to read in a multi-media world. They stress the importance of active reading based on information visualization and the importance of visual communication to capture attention, reinforce knowledge and increase audience responses. Visual literacy is about interpreting images of the present and past, and producing images that effectively communicate the message to an audience.

The concept of visual literacy was first crystallised by the writer John Debes, but as Jonassen and Fork noted, "visual literacy is eclectic in origin." Debes may or may not have coined the term visual literacy but indeed, he did provide its longest (and perhaps longest lasting) definition (Basson 2004):

> Visual literacy refers to a group of vision competencies a human being can develop by seeing at the same time he has and integrates other sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret the visible actions, objects, and/or symbols, natural or manmade, that he encounters in his environment. Through the creative use of these competencies, he is able to communicate

with others. Through the appreciative use of these competencies, he is able to comprehend and enjoy the masterworks of visual communication.

2.6.1.TheSignificance of Visual Literacy

The significance of visual literacy has been apparent throughout history and across disciplines. For example, the reading of directional signs in public places like the airport, maps and x-rays has been significant in our lives. Similarly, humans have relied on images to make meaningful interpretation and understanding of sophisticated and complex ideas such as mathematical or chemical formulas or the reading of architectural plans (Bemford, 2003). The mixing of linguistic and pictorial elements has been adjudged to be the best medium for explanatory representation for conceptual structures (Oring, 2000).

2.6.2.Benefits of Visual Literacy

Contemporary culture has become increasingly dependent on visual, especially for its capacity to communicate instantly and universally. A very high percentage of all sensory learning is visual. "It is often said that, *a picture is worth 100 words*. When visual symbols are used in place of words to express an idea or to evoke a feeling or a mood within us, it is necessary for the viewer to be able to understand the message (Oring, 2000).

Visualsarouse interest, set mood, arouse curiosity, make reading more enjoyable and create positive attitudes towards subject, content and towards reading itself.Oring (2000) argues that "The need to learn to read visual images is an urgent one that touches at all levels in our society". Visual literacy level directly determines our level of visual comprehension and the ability of the individual to be able to read images in a meaningful way. Pictures exist all around, they surround us. Understanding pictures is a vital life enriching necessity. Not to understand them is visual illiteracy.

Visual images are becoming the principal form of communication across cultures. Brumback (1995) said, *"We are heading to a culture of "visual literacy."* Fitzgerald (1995) also states that the proliferation of images mean that visual literacy is now crucial for obtaining information. Furthermore, Basson 2004 argues that we live in an era of visual culture, which influences our attitudes, beliefs values and life-style. Images are all over our environment, be it in the private or public domain, in a variety of different forms and through several channels of communication. Visual literacy allows a person to discriminate and interpret visual actions, objects, symbols that he or she encounters in the world. Visual literacy encourages an appreciation and comprehension of visual communication. A lack of awareness of visual literacy affects the ability to communicate effectively. By understanding the basic principles of visual literacy, people can produce images that communicate in efficient ways.Research has shown that the use of visuals/symbols in communication is significantly increasing globally (Anyoaha andDakyes2010).

2.7. International System of Typographic and Picture Education (ISOTYPE)

ISOTYPE is an acronym for “International System OfTYpographic Picture Education” (Tufte 2001).ISOTYPE was developed to visualize social, economic, and public information especially for uneducated persons in other to facilitate understanding of complex data. It was founded by a team led by Otto Neurath in 1924. Neurath achieved this with the help of a graphic designer,GerdArntz who joined him in 1927. He developed data graphics, the visual display of quantitative information into pictorial statistics, using what he named the *“Viennese method”.* This was a new method of visual education, an innovation in design using diagrams and eventually animated film. One of Neurath’sobjectives was to create *“helping language”* consisting of a set of internationally standardised graphic symbols:

> In the Far East, we see one language for writing, but a great number of languages for talking. We have made one international picture language (as a helping language) into which statements may be put from all the normal languages of the earth. We have given it the name ISOTYPE. A picture language of this sort is frequently very important and of great use...because pictures, whose details are clear to everybody, are free from the limits of language: they are international. WORDS MAKE DIVISION; PICTURES MAKE CONNECTION….It is a language which may be put into words in very different ways.

With its two-fold goal of *information and education*, the ISOTYPE project reached beyond pure design ambitions. It serves strangers coming to a foreign country, as well as help non-literate workers to access knowledge. In the end, it should even be of use as a helping language on an international encyclopaedia of common knowledge (Tufte, 2001).

As public information in a modern society is constantly increasing, the next step society requires is a plan for how this information pool could be best accessed. To this end,

Neurath attempted to create a systematized iconic form of communication that could work on an intercultural basis. As the outcome, ISOTYPE resembled more of a lingua franca than an ideal or universal language, but it also had helpful features beyond those of ordinary language. These features derived from its use of pictures rather than number of words. Neurath conceived his picture language as "an education in clear thought", which as an international system would serve the purpose of "debabelization" (Tufte, 2001) in business and science.

The main objective of language in communication is to be understood, words. A more effective medium, beyond the arbitrary use of words, would enhance iconicity and would lead to the development of an ideal language in which the degree of interpretation would be kept as low as possible.

ISOTYPE was intended to create ways to empower and educate the working class on important economic and social issues that could better their lives. Neurath envisaged a socially emancipated life made possible by public information. Today, it is used in public places to communicate important public information at a cross cultures and literacy levels.

2.8.Way-finding Design System

Researchers recognise the work of Kevin Lynch (Author, and Passini,1992) as being pivotal in professional thinking about how we understand environments. He coined the term *"way-finding"* which is used today in describing spatial features. Lynch believed

that all urban space could be described in terms of paths, edges, nodes, landmarks and districts. It was this *"language of space"* which enabled later researchers to communicate with test subjects about what they saw, remembered, and used when they tried to find their way. It has become part of the vocabulary of modern town planners, architects, and graphic designers.

The United States Department of Education, National Institute on Disability and Rehabilitation Research (2001) defines way-finding as "the ability to know where you are, where you are headed, and how best to get there, recognize when you have reached your destination, and find your way out, all accomplished in a safe and independent manner."

In addition, Way-finding is the organisation and communication of our dynamic relationship to space and the environment,(CIDEA, 2001). Way-finding can also be describe as designing environmental signs that guide people as they try to find their way in an unknown environment. Way-finding task, according to Arthur and Passini (1992), is completed when the person concerned reaches a desired destination. It is the ability for people to get from point A to point B, a process called way-finding – with minimal anxiety and aggravation; this will provide residents, visitors, and ultimately tourists, with some significant benefits (Heulat, 2007).

Mollerup (2005) however says it is all about *"way-showing and not way-finding".* Way-showing relates to way-finding as cooking relates to eating, or writing to reading. He believes that the purpose of way-showing is to facilitate way-finding, way-showing is the means, way-finding is the end. "It is all about accurately developing and

transmitting the information, while receiver is left to interpret it." (Mollerup, 2005).Therefore, he argues that it is way-showing and not way-finding.

Arthur and Passini (1992) enumerated some of the benefits of way-finding to include: reduction of stress and frustration for visitors; functional efficiency; visitor accessibility; safety; empowerment; improving cognitive skills of spatial understanding and creating a friendly environment.

The intention of way-finding is to guide the public to their desired destination with less effort. This can be achieved significantly if text and graphic symbols are employed as directional signs, for the purpose of communicating information to as many people as possible, irrespective of culture, and literacy. Gibson (2009) puts it this way:

> Way-finding has finally come of age, as predicted by many in the twentieth-century, our cities continue to sprawl as their infrastructures grow unwieldy. Getting people from place to place and orienting them in complex spaces is increasingly complicated, especially with all the transportation options now available... the expanding complexity of the world's built environment seems to be growing in direct proportion to the demise of the natural one... the beginning of the twenty-first century may, in fact, become way-finding's renaissance.

2.8.1. The use of Signs and Symbols in Way-finding Design

In a conference at Paris in1909, the first pictorial signs were agreed upon on an international level, that signs should have widespread meanings that can be universally understood, (Abdulla, andHubner, 2006). These signs are to be accepted and used by all around the world. They are recognised internationally, by the unique shape, and colour

employed. The symbols should be clear, simple, and easy to understand.Since symbols are visual representation of what we see daily, communicating public information with symbols becomesmuch easier. Because of symbols' unique visual element of association, it can communicate visual messages across-cultures.



Plate X: *Some signs and symbols. Source: htmwww.simbols&signs*

There are two basic ways to learn to communicate and represent the objects, actions and feelings in our lives with words and images. Words are very effective method of communicating complicated ideas. When symbols are not understood, words are important assistants. However, symbols can communicate across the language obstacles created by words. As obvious as that might sound, it is out of place to overlook symbols when planning and designing a way-finding and information systems, (Wildbur, and Burke, 1999).

2.8.2. The use of Typography in Way-finding Design

Typography plays a very important role in design of signage because they are more or less build up to text and symbols. It is therefore important to keep the design of information or way-finding product as simple as possible, so that users can find what they want and understand it when they get it. For many years, only capital letters were used on signboards and bill boards.However, studies have shown that a combination of upper and lower cases in texts increases the legibility of words and permits more space on the sign for the message to be understood easily Apelt, *et al*(2010).

Effective signage should communicate the clear message; words and phrasing are therefore important elements of effective signage. The most significant influence on legibility is typefaces,many typefaces have great potential to be used in signage design, but there are some special typefaces designed specifically for use in signage. DIN 1451, Frutiger, Johnston Sans, Rotis and Arial, MS Sans Serif, Tahoma, Futura, Geneva and Helvetica Medium typefaces are some of typefaces. Apart from their legibility and readability, they are typefaces that people who are vision impaired find easier to read (Niron 2009).

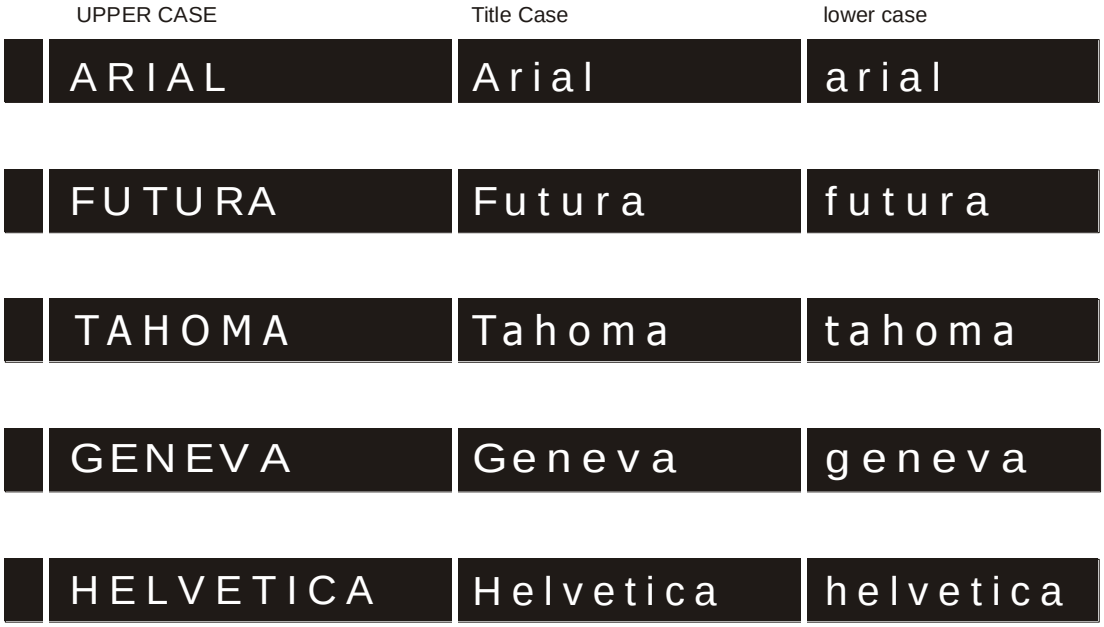


Plate XI:*Some typefaces for way-finding as advocated by Niron (2009)*

2.8.3.The use of Colour in Way-finding Design

Colour is important in way-finding and information design. In as much as all colours can work well with way-finding and information signs, it is important that the foreground and the background must have contrast to ensure readability and legibility. In order to achieve the aim of way-finding design, which is to help people in locating their desired destination with less stress, colours should be combine in a way that it will complement the sign with the environment. Though colour plays a reinforcement role in way-finding design, it should not be seen or used as the primary source of way-finding information, this is becausestudies have shown that "there are a number of people with colour vision lack, an illness that affects at least 8% of males and 2% of females, (Niron 2009). DS should also have colour contrast of at least 60% with the background colour of the sign so that it can be seen conspicuously.

Colour has a guide role in information design, and it is important to realise that colour is an element in way-finding design, corresponding to an arrow, message or a symbol. For example, colour red mostly use for stop signs, green is use as background colour for guide and information signs, blue also is used as background colour for traveller services, information signs, and emergency evacuation route signs.



RED for Stop



GREEN background for Information design



BLUE for Travelling

Plate XII: *Colours and their meanings in way-finding design Niron (2009)*

Although colour is an illusion of light at a particular frequency, it can be turned into an important tool in way-finding. It can serve to highlight a path or warn people away from an area. A combination of letters, symbols, and colours can create its own language at a cross-cultural level, especially for people who are moving from one point to another in a complex environment that they are not too familiar with (Niron, 2009).

2.9.Conclusion of the Review of Related Literature

The research findings, presented by each of the authors cited in this chapter, were carefully synthesized. These haveestablished a significantly sound basis for this work on the combination of texts and symbols for effective communication in Jos metropolis. It has alsoprovided a reference by which any contributions to knowledge, presented herein, could be measuredYakubu (2010). Specifically, the authors, and their influences on this research is summarised as thus: In information design, combining texts and graphic symbols could be effective in communicating intended messages, (Tufte, 2001).Mayer and Gallini (1990) found the use of visuals to be an effective presentation strategy when the visual material explained the information in the text.

The need to adapt symbols or representational pictures (with the basic features of resemblance and simplicity) on DS design for the Jos metropolis can be traced to the findings of Niron 2009. He also encouraged the testing of symbols before putting them to use. This study strongly recommendsthat symbols for use in Jos metropolis, should be properly tested, and a large-scale education of the public on their meanings should be done before they are put into use.

In way-finding design, colour plays a reinforcement role as advocated by Niron (2009). He strongly suggests for at least 60% contrast between the background and foreground colour of DS. Colourhowever, should not be seen or used as the primary source of way-finding information, this is because studies have shown that there are a number of people with lack of colour vision, an illness that affects a least 8% of males and 2% of females(Niron, 2009).

On the use of typography on DS for the city of Jos, types should be used in such a way that it willbe simple and easy to see and understand,this is because type not only sets the stage for words message, but also becomes the message. If properly used, types can explain an idea and visually become the idea. Types do not only inform, but can also express. It makes information more attractive (Wheildon, 1995). There is need for great cautionhowever, in relying on "texts only" DS in Jos metropolis, this is because, according to the Federal Office of Statistics (2010), the literacy level of Plateau State is estimated at about 56%.

In conclusion, the combination of text and graphic symbols is effective in communicating public information, as shown in studies reviewed. This research therefore, conducted a public symbol perception test on the said population, subsequently, the result of the findings wereusedto developedstudio based DS for Jos metropolis. The combination of survey and experimental methods of research were employedin conducting the investigation.

Chapter 3.METHODOLOGY

3.1. Introduction to Methodology

The objectives of this study were to:determine the effectiveness of directional signs that conform to ISOTYPE standards in Jos metropolis; determine whether the existing directional signs within the Jos metropolis conform to ISOTYPE norms and standardsand consequently, to develop a studio designed DS that will communicate to all,irrespective of language and literacy levels in Jos metropolis.ISOTYPE will frequently be referred to as the combination of written text or types and graphic symbols on directional signs.

To achieve theseobjectives,photographs of some of the existing DSin Jos metropolis wererandomly selected from the study area. The study area consists of six Local Government Areas of Plateau State. Efforts were made to ensure that each local government area had DS represented in the population of the study. It is worth mentioning that as a result of the massive road construction at the time of the study, only a few DS could be found, as some of the existing DS were removed. Theselected DS were carefully examinedto determinewhether they conformed to ISOTYPE standards.Secondly, conventional symbols for public places and facilities were sourced from published materials and internet,these publicsymbols were presented to non-literate and literate respondents within Jos metropolis to identify. The aim of presenting these symbols to respondents wasto test their ability to correctly identify public symbolsand what they represent, before putting them to use.Expectedly, the result of these findings gave this study the impetus to draw conclusions, consequently, a studio designed DS that combine visible and legible text/typefaces with symbols (Niron, 2009),was developed for Jos metropolis. This chaptertherefore broadly discusses the

research design, population, sampling, instrumentation, validity of instruments, and data analysis.

3.2. Research Design

This study combined the survey and experimentalresearch design methods.In using the surveymethod,questionnaire was designed basically to test the ability of respondents, both non-literate and literate to identify and recognised public symbols in Jos metropolis.The data collected were carefully analysed to determine the correct level of symbolsidentification/recognition in Jos metropolis, based on literacy levels. Interviews were also conducted, especially for non-literate respondents. Ngu (2009) observed that survey research deals with studies of fractions or parts of a large or widely spread groups of people. He went further to say that in a survey research, the primary interest and activity is a focal study of people's perception, beliefs, opinions, values, needs among others.

In this study, the stratified sampling technique was adopted. This is because the population for this study consists of the non-literate and literate persons from heterogeneous cultural backgrounds.Since the studyisinterested in the literacy levelsof respondents in identifying and recognising graphic symbols and what they represent, DS were selected from the six Local Government Areas. This is to ensure that each local government is fairly represented in the study. The questionnaire was therefore distributed to the non-literate and literate respondents.The experimentalapproach of this studywas in two-fold. Internationally recognised symbols for public places wereenhanced, using computer graphic software in the studio,respondents' ability to

identify/recognise these symbols were tested. Based on the findings of the symbol identification/recognition test, a proposed DS design for Jos metropolis wasproduced in the studio. Computer aided programmes such as Corel-draw and photo-shop wereemployed for the design.

3.3. Population of the Study

According to Fagbohungbe(2009), population is thecomplete set of people, occurrences or objects that possess, a specific set of one or more common characteristics that the research needs. Though the population of theresidents ofthe six Local Government Areas covered by the Greater Jos Master Plan is put at about 1.3 million, (National Population Commission. 2007),representational samplesthat consist of non-literate and literate respondentswere used for this study.Ten DS, within the six local government area were also randomly selected.Theresponsesof respondents were used to determine whether ISOTYPE directional signswill beeffective in communicating public information to all levels of literacy.

3.4. Sampling Method of the Study

Stratified Random Sampling was adopted in selecting DS and respondents in collecting data for this study. The ten selected DS were selected from the six local government areas. In each of the local government, at least one DS was randomly selected for this study. The study also ensured that in each of the six Local Government Areas, twenty five non-literate and twenty five literate persons were randomly selected.Questionnaires were administered to respondents within the study area, afterwhich,data collected from

these respondents wereanalysedbased on literacy levels, and some valid general conclusions were made.

3.5.Data Collection of the Study

Data used in this research were collected from primary source; specifically and directly from both the residents and visitors through the use of questionnaires and interviews,as well as secondary source; published materials on DS, professional Journals, Internet sourced materials.Photographs of the existing DS in Jos metropolis werealso use.

3.6. Instrumentation of the Study

The instruments usedfor this study werebasically a digital camera to photograph the existing DS within Jos metropolis;questionnaires, interview and observation were also use. Thequestionnaire wasdivided into twosections; the first section (a)addressthe issue of bio data, which included; literacy level, and residential status and nationality.The second section consists of tenpublic symbols,systematically arranged on one side of the paper, while the written text of what those symbols represent were jumbled on the other side. Respondents wereexpected to draw a line from the symbol to the written text that represented the symbol. This exercise testedthe ability of respondents to identify and recognise symbols before putting them to use in Jos metropolis.A total number of 300 questionnaires were administered to respondentswithin the six LGA's, and a total number of 282were returned. Each of the questionnairescontainsten different public symbols forrespondents to identify.Assistants and guides to help interpret the questions in the language that suits the individual respondents wereemployed. This is very

important because thebottom line of this study was the investigating the responses of the non-literate (those who cannot read English) in identifying and recognising these public symbols and what they represent, before drawing any conclusion.

3.7. Validity of Instruments

To validate the instruments of this study, the designed questionnaires were subjected to a pre-test on subgroups of the sampled population. Observations on the questions were corrected, for examplemost of the questions were opinion-measured instead of direct measure. Questions asking marital status and age were not relevant for this study, subsequently, only relevant questions were asked. Twenty internationally recognisedpublic symbols selected for respondents to identify, but because some of the symbols do not seem to directly depict what they represent, attaching meanings to them were a bit difficult and complex, for example, a DS that has a key and a brief case under it. The swimming pool symbol DS was too abstract for respondents, especially the non-literate respondents to recognise. Some of the symbols were dropped to a manageable size of ten because of the problem of iconicity, while some were adjusted to allow for betteridentification/recognition.Consequently, result of these findings on the study population can be generalised.

3.8. Data Analysis

The questionnaire wasdrawn in such a way that non-literate and literate respondentswere to simply draw a line to what the symbol represented,the result of the findings were transcribed and tabulated in order to develop the data analysis. Answers

were presented in frequencies according to the most common responses provided by respondents as regards the correct identification of each symbol and what it represents. The findingswereclassified into answer categories and wereexpressed in percentile frequencies.

The statistical method adopted for the analysis of data was the use of Simple Frequency Analysis, which is based on data identification, the key elements contain in a message or information by respondent wastransformed into units that facilitated their description and analysis. This method was adopted because it allow these findings to infer objective and reliable statements based on the data provided by the respondents and the context in which they weremade.

Chapter4.DATA PRESENTATION AND ANALYSIS OF FINDINGS

4.1. Background

It is the assumption of this writer that the combination of written text and graphic symbols as DS in Jos metropolis, will effectively communicate intended information to more people, irrespective of their language and literacy levels than text only or symbol only.

Consequently, the research questions were constructed to allow for conclusions to be made. Data collected were analysed based on each of the research questions. This chapter therefore presents the results of the findings as well as the description of studio work.

4.2. RQ1: Do the existing directional signs within Jos metropolis conform to ISOTYPE standards and norms?

The tenrecorded photographs of existing DS in Jos metropolis were presented to show whether they conform to ISOTYPE standards and norms. ISOTYPE advocate for the combination of written textand graphic symbols.

Below is the critical analysis of each of the ten randomly selected DS recorded in Jos metropolis in the course of thisinvestigation. The aim of this analysis is to ascertain whether DS in Jos metropolis combine written text and graphic symbols.



Plate XIII:A Motor Park DS.
This is a Motor Park DS at the Jengre in Bassa LGA, it has "Written text"in bold capital letters in white, and green colourbackground. No symbol.



Plate XIV:A Swimming Pool DS
This Swimming Pool DS at Hwolshe, Jos South has written text only, a dirty white background colour, with "text only" in red capital letters that are not very legible.



Plate XV: An Airport DS
This Airport DS at theHeipang Airport, BarkinLadiLGA has"symbol only", a plane in white colour, descending to the right.. It has a green background colour. The board was constructed in an arrow form, pointing to the direction of the airport. No text.



Plate XVI:A Hotel DS
This is Hill Station Hotel DS atJishe, Jos NorthLGA has “symbol only”, a symbol of a bedin white colour and a red colourfolded blanket on a green background. No written text.



Plate XVII:A Restaurant DS
The Hill Station Hotel Restaurant DS atJishe, Jos NorthLGA has “symbol only”, a white background with a green borderline, a green bottle and a green bowl filled up with food represented in a yellowand red colour. No written text.

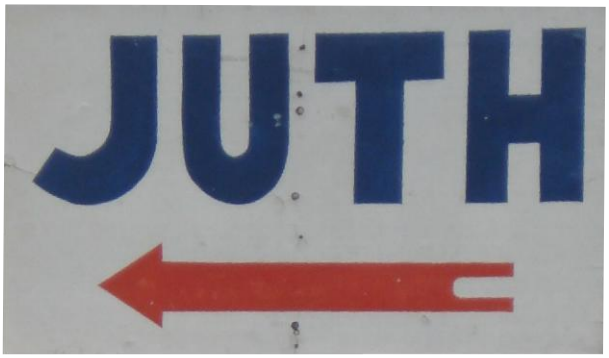


Plate XVIII:DS for the Jos University Teaching Hospital
Located atLamingo, Jos EastLGA, the JUTH DS hast text and arrow,a white background, boldly written JUTHin a deep blue capital letters, (Jos University Teaching Hospital). Below the text is an arrow in red, pointing to the direction of the Hospital.



Plate XIX:A Post Office DS
On a very busy street of Ahmadu Bello Way Jos, City Centre, The DS has written"text only", in capital letters in green on a white background.. No symbol.



Plate XX: Jos Museum DS
Located behind Ahmadu Bello Way Jos, City Centre, The Jos Museum DS has written "text only",boldly in capital letters in white on abrown background colour. No symbol



Plate XXI: Plateau State Specialist Hospital DS
Located at Old Bukuru Road, Jos, the board is on a white background, divided into two parts. The upper part has a written text: Plateau State Specialist Hospital in black bold capital letters. The lower part has a green background with a symbol of a bed on the right in white colour, on the left side is a symbol of tick cross in white colour. (text and symbols). A drip stand is also seen at the right side in white on a green background.



Plate XXII: New Era Cinema DS
Located at New market Road, Jos, The New Era Cinema has written"textonly" in black on a yellow background in capital letter.No symbol.

The ten DS presented in this study indicated that six DS had text only, three had symbols only and one combined text and symbol.

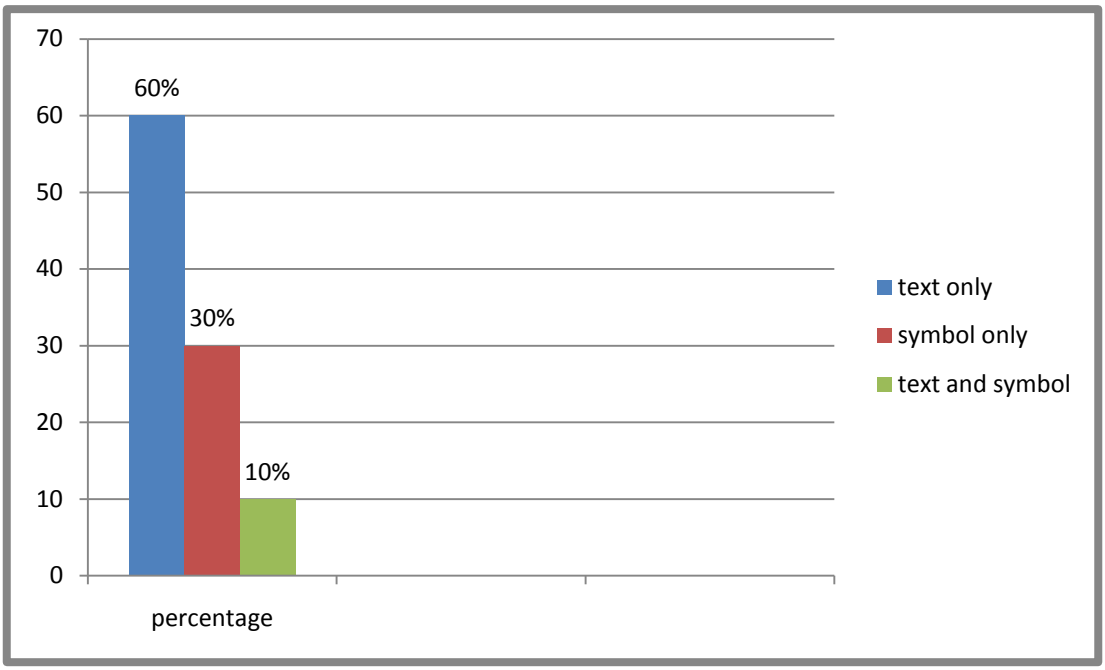
Table 4.1. 1: A summary of the recorded photographs of the existing DS in Jos metropolis.

Directional Signs	**Text Only**	**Symbol Only**	**Text and Symbol**
Motor Park	*	-	-
Swimming Pool	*	-	-
Airport	-	*	-
Hotel	-	*	-
Restaurant	-	*	-
JUTH	*	-	-
Post Office	*	-	-
Jos Museum	*	-	-
Plateau Hospital			*
New Era Cinema	*	-	-
TOTAL	**6**	**3**	**1**

Table 4.1.1.

DS in Jos	**Frequency**	**Percentage**
Text Only	6	60%
Symbol Only	3	30%
Text and Symbol	1	10%
Total	**10**	**100%**

Table 4.1.2.



Graph 4.1.: Showing the result of the DS recorded in Jos Metropolis

The result showed that 60% of the DS recorded are text only, 30% were Symbol only. Only 10% had both text and symbols combined as DS.

4.3. RQ2: Would directional signs in Jos metropolis that conform to ISOTYPE standards be effective in communicating intended public information to all, irrespective of language and literacy levels?

The works of Neurathand Mayer and Gallini (1990) as cited in this study agreed that the combination of text and symbol communicates the intended massage to people irrespective of literacy levels. Theyfound the use of visuals to be an effective presentation strategy when the visual material explained the information in the text. This study selected tengraphic symbols and presented them tonon-literate and literate respondentswithin the study areato identify. The aim was to test the level of symbol identification (visual literacy) in Jos metropolis before recommending them for use, as statedin a study by Collins*et al*, in Niron (2009), who strongly advised that such public symbols be tested before putting them to use.

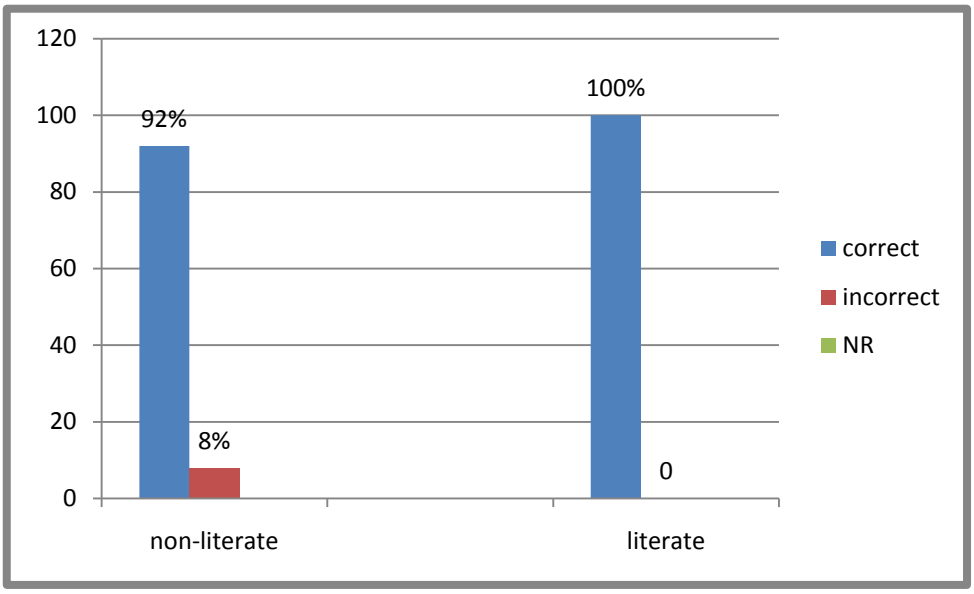
A total 300 questionnaires containingten public symbols with written text on each were administered. 150 were directed atthe non-literate respondents while the other 150 wereto the literate respondents.For the non-literate, all the 150 questionnaires were retrievedwhile 132 were retrieved from the literate respondents, making a total of 282 returned questionnaires. The result of the symbol identification/recognition skill is presented below.

4.4. Comparativetable display of Symbols Identification test for Non-literate and Literate Respondents in Jos metropolis

Table 4.4.1.Taxi Park Symbol

	non-literate		literate	
	Frequency	Percentage	Frequency	Percentage
correct	138	92	132	100
incorrect	12	8	0	0
NR	0	0	0	0
Total	150	100	132	100

Table 4.4.1.



Graph 4.4.1: showing the result of the non-literate and literate respondents on the identification of the Taxi Park Symbol

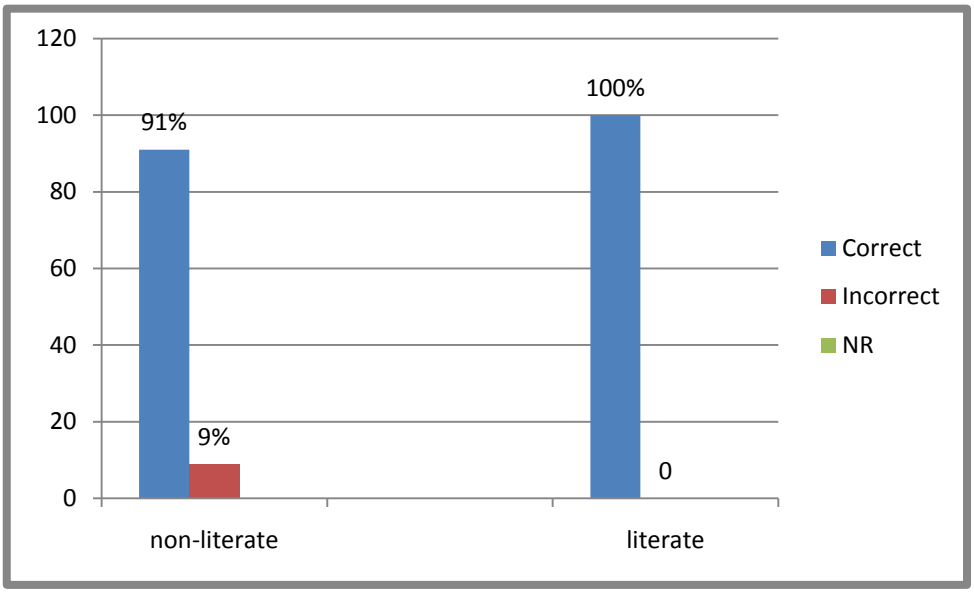
The result shows that 92% of the non-literate respondents correctly identified the Taxi

Park Symbol, while 100% of literaterespondents did correctly.

Table 4.4.2. Restaurant Symbol

	non-literate		literate	
	frequency	percentage	frequency	percentage
correct	136	91	132	100
incorrect	14	9	0	0
NR	0	0	0	0
Total	150	100	132	100

Table 4.4.2.



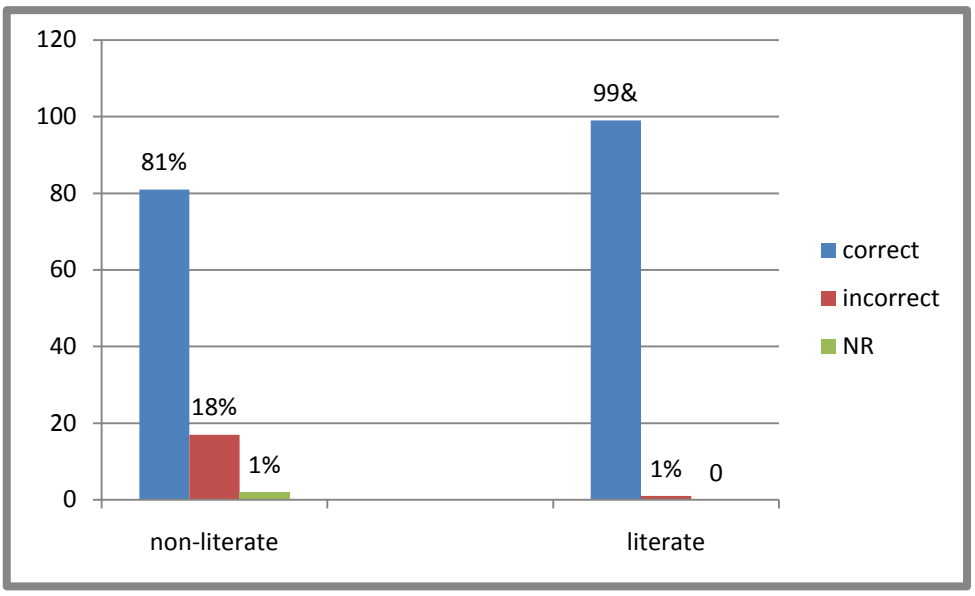
Graph4.4.2: showing the result of respondents on the identification of the Restaurant Symbol.

The result shows that 91% of the non-literate respondents correctly identified the restaurant symbol, while 100% of the literate respondents did correctly

Table 4.4.3: Hospital Symbol

	non-literate		literate	
	frequency	percentage	frequency	percentage
correct	122	81	131	99
incorrect	26	18	1	1
NR	2	1	0	0
Total	150	100	132	100

Table 4.4.3.



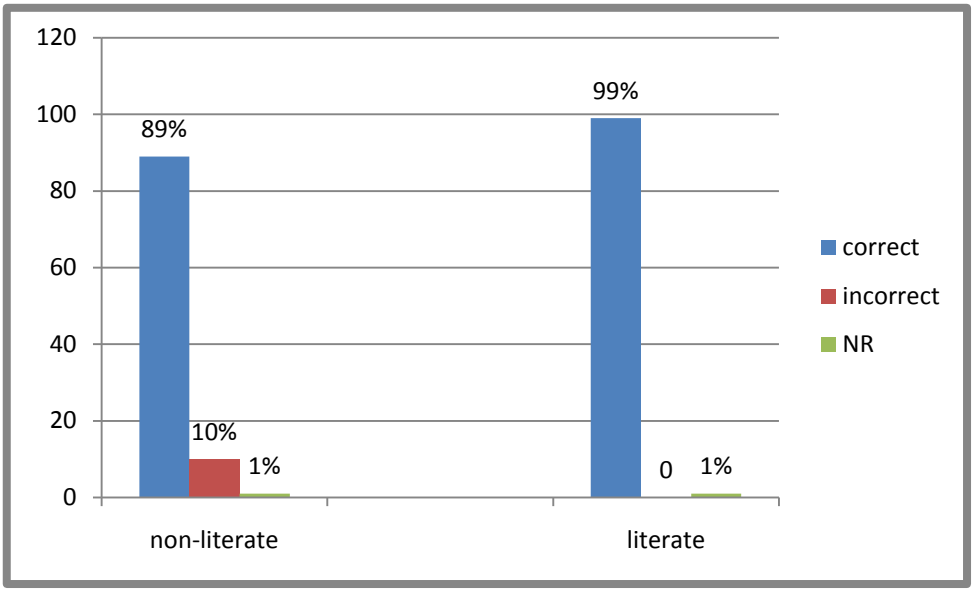
Graph 4.4.3: showing the result of the non-literate and literate respondents on the identification of the Hospital Symbol.

This result shows that 81% of the non-literate respondents correctly identified the hospital symbol, while 99% of literate respondents did correctly.

Table 4.4.4.Telephone Booth Symbol

	non-literate		literate	
	frequency	percentage	frequency	percentage
correct	134	89	131	99
incorrect	15	10	0	0
NR	1	1	1	1
Total	150	100	132	100

Table 4.4.4.



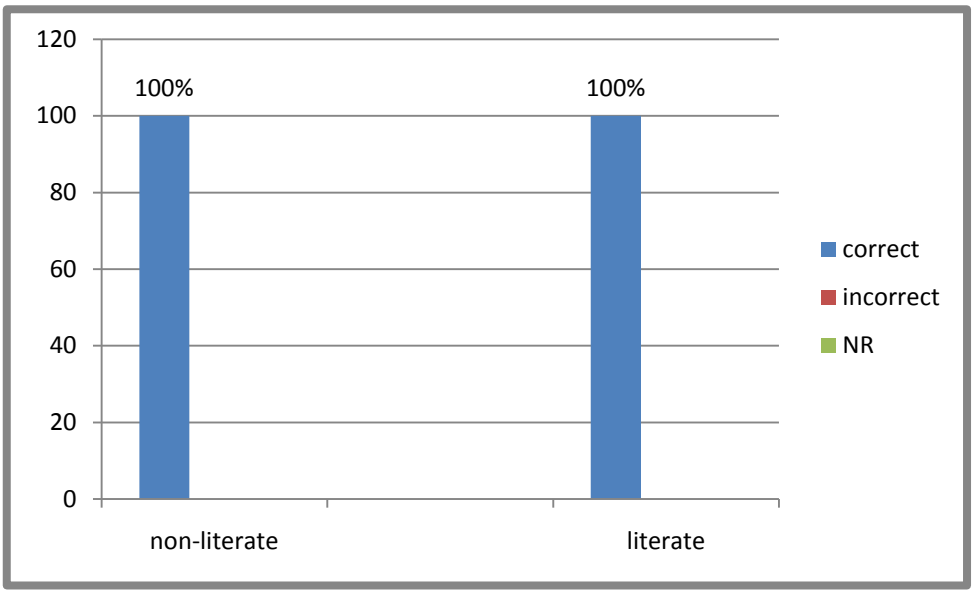
Graph4.4.4: showing the result of the non-literate respondents on the identification of the Telephone Booth Symbol.

The result shows that 89% of the non-literate respondents correctly identified the telephone booth symbol, while 99% of literate respondents did correctly.

Table 4.4.5.Post Office Symbol

	non-literate		literate	
	frequency	percentage	frequency	percentage
correct	150	100	132	100
incorrect	0	0	0	0
NR	0	0	0	0
Total	150	100	132	100

Table 4.4.5.



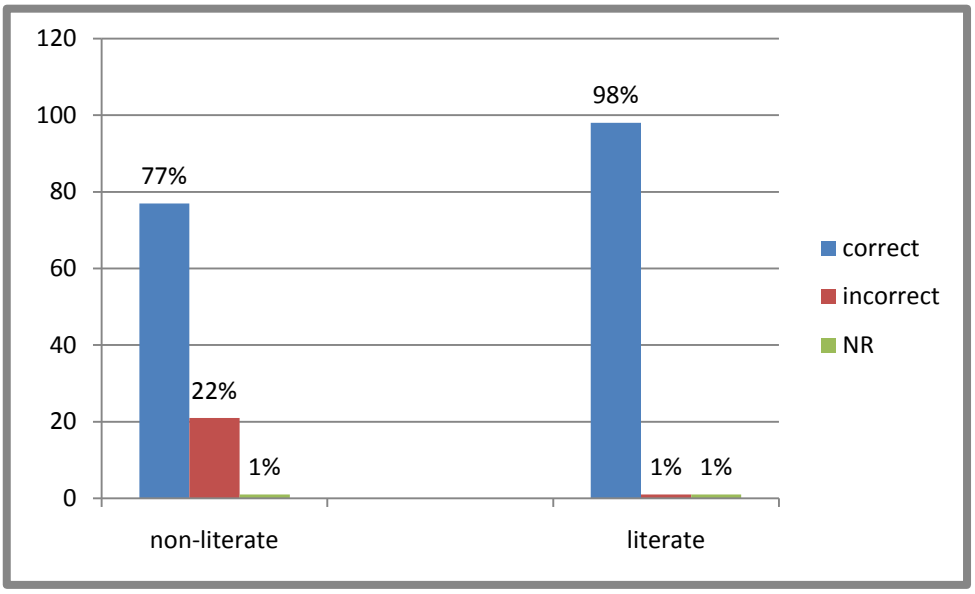
Graph4.4.5:showing the result of the non-literate and literate respondents on the identification of the Post Office Symbol.

This result shows that100% of the non-literate and literate respondents correctly identified the post office symbols.

Table 4.4.6. (Ladies/Gents)Toilet Symbol

	non-literate		literate	
	frequency	percentage	frequency	percentage
correct	116	77	130	98
incorrect	32	22	1	1
NR	2	1	1	1
Total	150	100	132	100

Table 4.4.6.



Graph 4.3.6: showing the result of the non-literate and literate respondents on the identification of the Ladies/Gents Toilet Symbol.

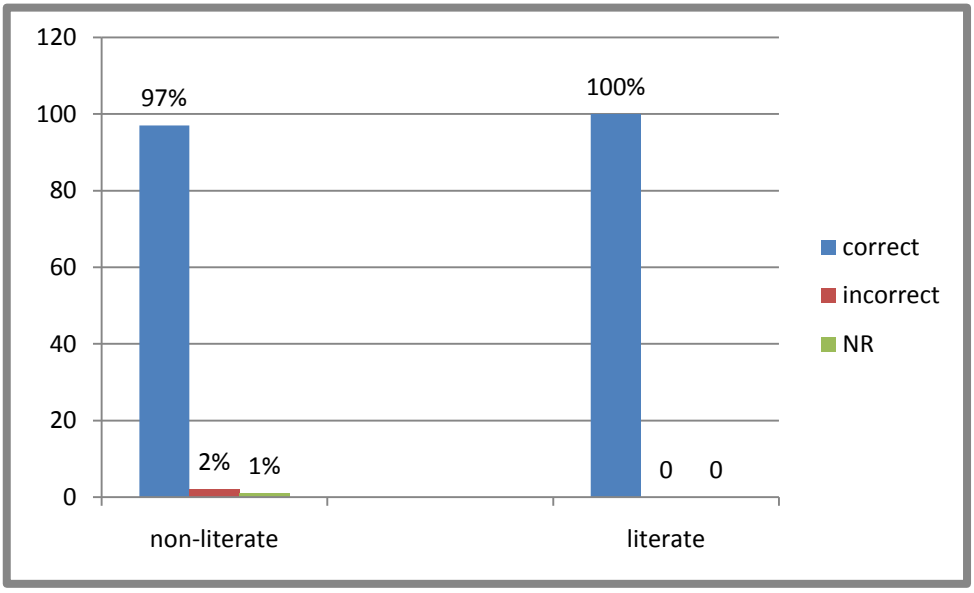
This result shows that 77% of the non-literate respondents correctly identified the

Ladies/Gents (Toilet) symbol, while 98% of literate respondents did correctly.

Table 4.4.7.No Parking Symbol

	non-literate		literate	
	frequency	percentage	frequency	percentage
correct	145	97	132	100
incorrect	4	2	0	0
NR	1	1	0	0
Total	150	100	132	100

Table 4.4.7.



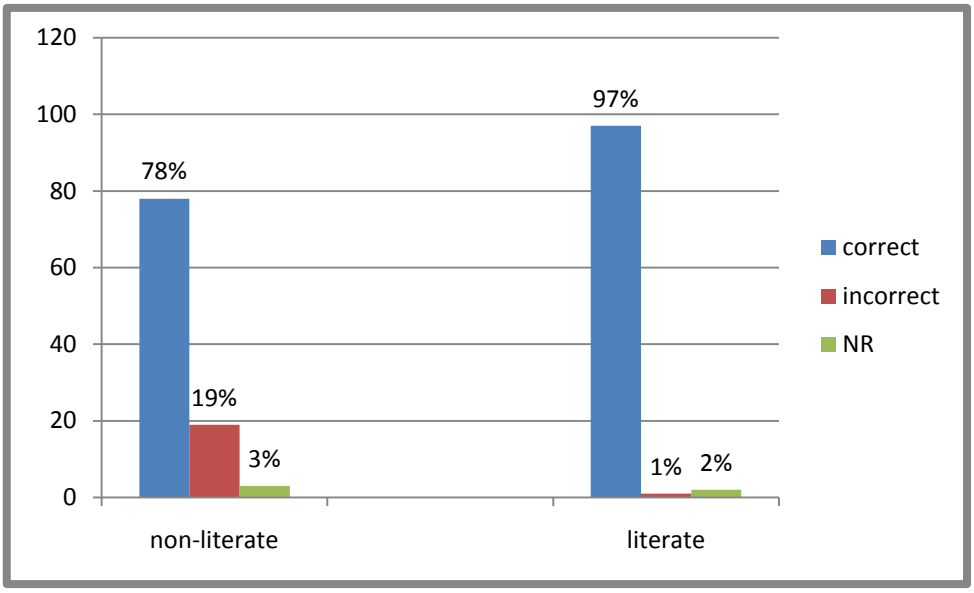
Graph 4.4.7: showing the result of the non-literate and literate respondents on the identification of the No Parking Symbol.

This result shows that 96% of the non-literate respondents correctly identified the No Parking Symbol, while 100% of literate respondents did correctly.

Table 4.4.8.Swimming Pool Symbol

	non-literate		literate	
	frequency	percentage	frequency	Percentage
correct	117	78	129	97
incorrect	28	19	1	1
NR	5	3	2	2
Total	150	100	132	100

Table 4.4.8.



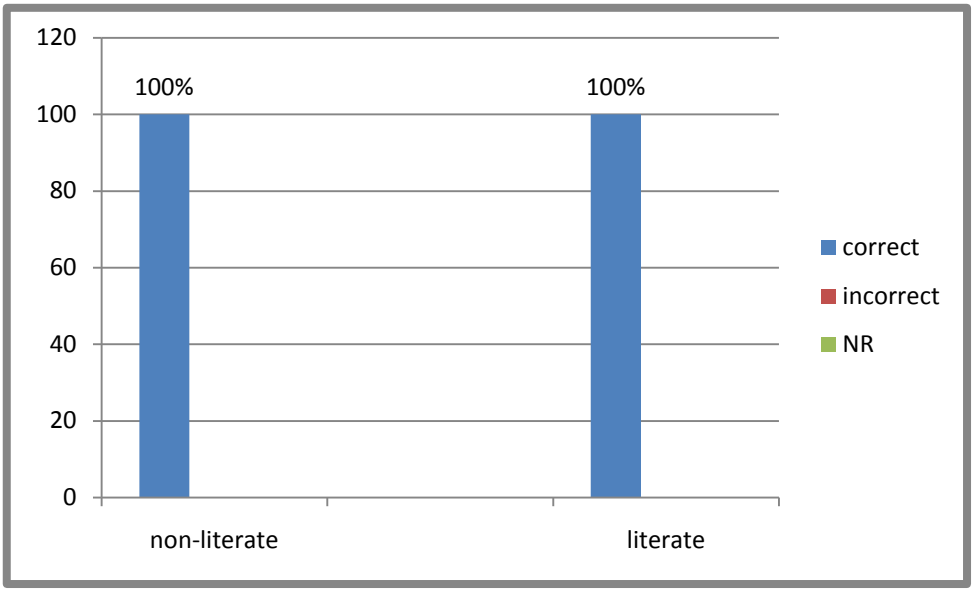
Graph 4.4.8: showing the result of the non-literate and literate respondents on the identification of the Swimming Pool Symbol.

The finding shows that78% of the non-literate respondents correctly identified the swimming pool symbol, while 97% of respondents did correctly.

Table 4.4.9.Bus Stop Symbol

	non-literate		literate	
	frequency	percentage	frequency	percentage
correct	150	100	132	100
incorrect	0	0	0	0
NR	0	0	0	0
Total	150	100	132	100

Table 4.4.9.



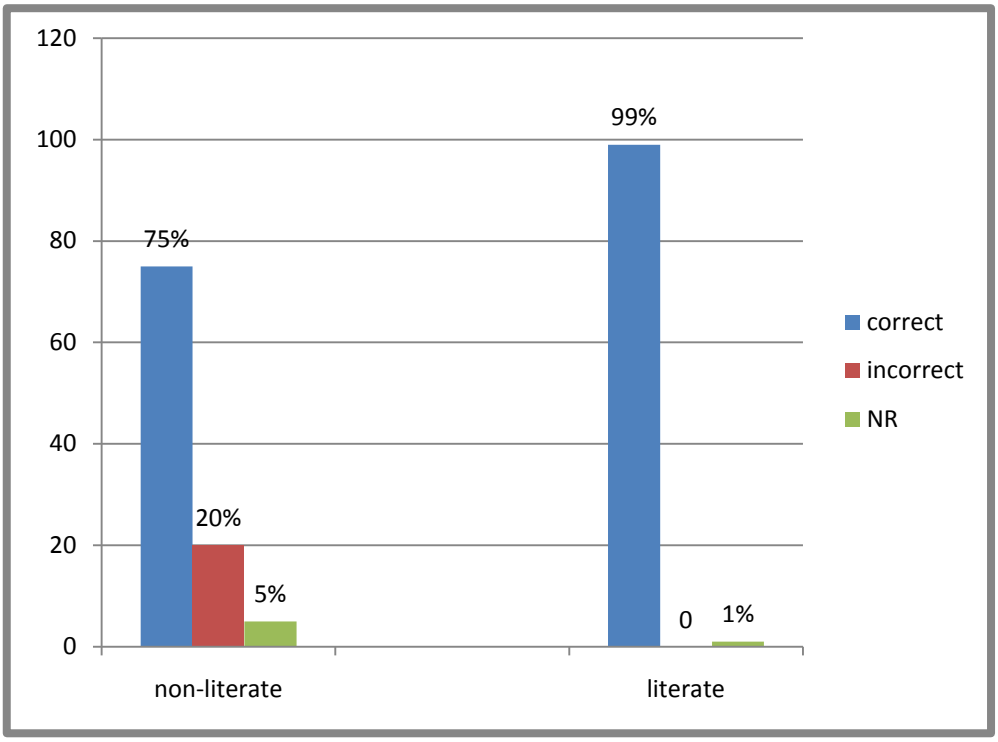
Graph 4.4.9: showing the result of the non-literate and literate respondents on the identification of the Bus Stop Symbol

The investigation revealed that 100% of the non-literate and literate respondents correctly identified the Bus Stop Symbol.

Table 4.4.10.HotelSymbol

	non-literate		literate	
	frequency	percentage	frequency	percentage
correct	112	75	131	99
incorrect	30	20	0	0
NR	8	5	1	1
Total	150	100	132	100

Table 4.4.10.



Graph 4.4.10: showing the result of the non-literate and literate respondents on the identification of the Hotel Symbol

The investigation revealed that 75% of the non-literate and 99% of literate respondents correctly identified the Hotel symbol.

4.5.Data Analysis and Interpretation

In the analysis and interpretation of the data collected for this study, the pictures of the existing DS in Jos as randomly selected by the researcher were carefully studied. The symbol identification/recognitiontest responses of non-literate and the literate respondents were put together for a comparative visual analysis.

From the photographs of the existing DS in Jos metropolis recorded during this investigation, 60% were “text only”, 30% had“symbols only” while 10% had both text and symbols. This finding shows that most of the DS in Jos metropolis do not conform to ISOTYPE standards, since only 10% of the DS combined text and symbol. ISOTYPE strongly advocates for the combination of text and symbol in communicating public informationat all literacy levels effectively.

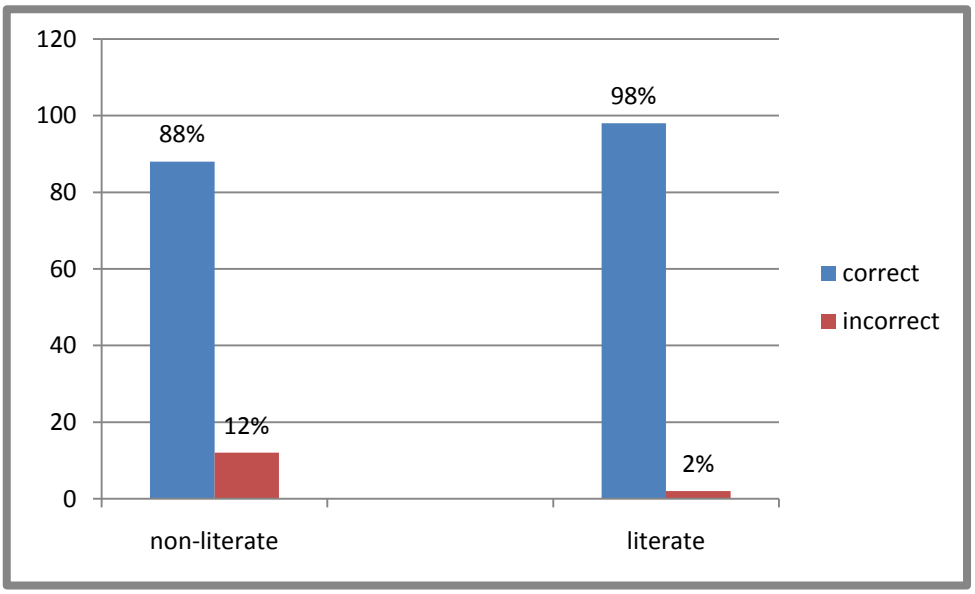
The symbol identification/recognition test was to determine the effectiveness of combining text and symbol as DS in Jos metropolis. The result shows that 88% of the non-literate respondents identified the symbolscorrectly, while 98% of the literate respondents identified the symbols correctly.This result shows that even though the non-literate respondents could not read the labeled symbol, 88%respondents were able to visually interpret the symbols and attached meanings to them correctly.

Table 4.5.1.shows the summary of the findings of the symbol identification test between the non-literate and literate respondents in Jos metropolis

S/N symbols	Non literate correct identification	Literate correct identification
1. Taxi	92%	100%
2. Restaurant	91%	100%
3. Hospital	81%	99%
4. Telephone	89%	99%
5. Post Office	100%	100%
6. Ladies/Gents	77%	98%
7. No Parking	96%	100%
8. Swimming	78%	97%
9. Bus Stop	100%	100%
10. Hotel	75%	99%
TOTAL	**88%**	**98%**

Table 4.5.1.

4.5.1. Non-Literate and literate Symbol Identification result



Graph 4.5.1: shows that 88% of the Non-Literate and 98% of literate respondents correctly identified the symbols.

Chapter5.DISCUSSION OF FINDINGS AND STUDIO PRACTICE

5.1. Background

The objectives of this study are to; determine the effectiveness of directional signs within the Jos metropolis that conform to ISOTYPE standards in communicating intended public information to all, irrespective of language and literacy levels, determine whether the existing directional signs within the Jos metropolis conform to ISOTYPE norms and standards, and finally, to propose the development of a non-verbal communication system as DS for Jos metropolis using ISOTYPE standards.Consequently, research questions were constructed to enable the findings achieve these objectives.

5.2. RQ1: Do the existing directional signs within Jos metropolis conform to ISOTYPE standard?

Ten of the existing DS in Jos metropolis were documented for this study,onlythe Plateau State Specialist Hospital DS combined text and symbols, as advocated by ISOTYPE.Six DS had “text only” while three had “symbols only”.



Figure 5.2.1:The Plateau State Specialist Hospital with written text and symbol

The written text on the Plateau State Specialist Hospital DS had upper casesin black colour on a white background, creating a good contrast, (Niron 2009) advocated for at least 60% contrast between the text and the colour of the background so that the message can be seen conspicuously, thereby making the information legible. However, Apelt, *et al*(2010), established that a combination of upper and lower cases in texts increases the legibility of words and permits more space.Similarly, some inconsistences were clearly observed on the typefacesused on the DS, they appeared like FujiyamaExtraBold, with some of the fonts are bigger and wider thanothers, a closer look at the typefaces revealed that they were manually designed, stenciled and then dabbed on the board.

The symbols used on the Plateau State Specialist Hospital DS showed a white tick cross on a green colouredbackground on the left side of the board, a detailed perspective visual representation of an empty bed in white colouris on the right side of the DS, a drip stand is displayed at the edge of the bed, all in white colour. The symbol of the cross, as observed wasplaced far from the empty bed. Ryan and Shwarzt (Niron 2009) in their study on pictorial representation however, tried to determine the level of speed at which respondents can identify relative parts of the pictures correctly. The result showed that the cartoon/symbol type was significantly fast and easier to comprehend. The bed on the Plateau State Specialist Hospital DS was however too detailed, more so, as observed in this study, the internationally recognisedhospital symbol has a red crossand a symbol of a person on the bed. In some instances, a drip stand is also displayed close to the bed.



Figure5.2.2. A Hospital DS (Researcher's Construct)

Even though the Plateau State Specialist Hospital DS combined text and symbols, the two elements (Text and Symbol) were not adequately harmonised to produce a DS that will communicate the desired information effectively. Furthermore, the basic elements and principles of design were not adequately utilized in the design of the DS.

The remaining nine DS had either text only or symbol only, and were also not properly executed. It can therefore be concluded from the ten presented DS, only 10% combined text and symbol in Jos metropolis.

5.3. RQ2: Would directional signs in Jos metropolis that conform to ISOTYPE standards be effective in communicating intended public information to all, irrespective of language and literacy levels?

As stated early, works of particularlyNeurathand Mayer (1991), were cited in this study to ascertain the effectiveness of combining text and symbol in communicating public information across culture and literacy levels. The researcher selected ten graphic symbols and presented them to non-literate and literate respondents in Jos metropolis to identify. The aim was to test the level of symbolidentification/recognition skills of respondents before recommending them for use in Jos city, as stated in this study earlier. The result showed that 88% of the non-literate respondents identified the symbols correctly, while 98% of the literate respondents identified the symbols correctly. Some of the symbols identification tests are discussed below.

Taxi symbol: Ninety-Two percent of the non-literate respondents correctly recognized the taxi symbol, 8% could not identify it correctly. This could be because the symbol is in black and white, making it a bit difficult for them to recognise or identify. One hundred percent of the literate respondents were however, able to read the text and identified the taxi symbol correctly.

Restaurant symbol: Ninety-One percent of the non-literate respondents recognised the restaurant symbol correctly, while 9% could not. This could be attributed to the fact that the plate, fork and spoon represented on the symbol are not very common amongst some of the non-literate respondents,some of them still use calabash to serve food and eat with their bare hands. Even though they have seen spoon and fork, but they could not associate it with restaurant-a place where food is sold. On their part, the literate respondents got themall what they did was to read the written text attached meaning to it.

Hospital symbol: Eighty-One percent of the non-literate respondents were able to correctly identify the hospital symbol, while 18% could not.The symbol of a hotel and hospital were very similar, the non-literate were foundit difficult to differential them. One percent of the literate respondents could not identify the hospital symbol correctly. The researcher observed that most of the literate respondents hardly make time out to carefully study the symbols before assigning meanings to them. This could be why 1% of the literate respondents could notrecognise the hospital sign correctly. It goes to show the need for a proper education on use and importance of public symbols, before putting them to use as cited in this study.

Ladies/Gents symbol: This symbol clearly showed a silhouette of a male and female figure, but it has gone further to become a symbol of toilet male/female. The male symbol represents a male toilet while the female symbol represents the female toilet. This is where iconicity of symbol comes in. This could why about 23% of the non-literate respondents could not identify it correctly. Two percent of the literate respondents also failed to identify it correctly. The also call for proper education on the meaning of symbols and what they represent.

Hotel symbol: Some of the non-literate respondents could not differentiate hotel from hospital symbol. This attributed to 25% not correctly identifying the symbol. One percent of the literate could not correctly identify the hotel symbol.

5.4. Summary of Discussion

Theresult of this finding showsthat only 10% of the recorded DS within Jos metropolis combined written text and symbol as DS. This therefore means that most of the DS in Jos metropolis do not conforms to ISOTYPE standards and norms.

Furthermore, 88% of non-literate respondents,who could not read or write, were however, able to visually interpret the symbols and attached meanings to them correctly, while 98% of the literate respondents were also able to,identified the symbols. The result shows that literate respondents had an advantage over the non-literate respondents. Since they could read, they simply read the written text, attached it to what it represented in the form of symbol, and 98% identified them correctly.Atotal of 93% of all respondents correctly identified the symbols presented.

Theoutcome of the findingson the non-literate ascertained the claims advanced by scholars cited in this study, they all affirmed that the combination of text and symbol is effective in communicating public information to all, irrespective of language and literacy levels.

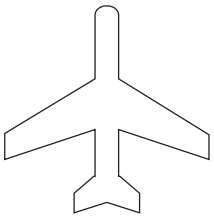
5.5. Studio Practice Process

To meet up with the last objective of this study, which is to develop a studio based design of DS that will combine written text and graphic symbols for Jos city, some internationally recognised symbols for public places were adapted. Written texts, explaining briefly, what the symbols represented were added to be translatedthem into

Directional Signs, so that both the non-literate and literate audience will understand the message on the DS. Abdullah and Hubner (2006)stated that “symbols for international use must be understood universally, and be accepted by all round the world. The unique shape and colourshould make them universal.”

The symbols were further enhanced, using computer-aided programmes, colours and written texts were added, thereby translating them into Directional Signs. For example the result of the pretest showed that the symbol of swimming was difficult for respondents to identify correctly; measures were taken to improve on it.

5.6. Signs, Symbols and Directional Signs (DS)



AirplaneAirport



Airport DS





EnvelopePost Office



Post Office DS





Telephone



TelephoneBoothTelephone Booth DS





Bus



Bus StopBus Stop DS





Female and Male



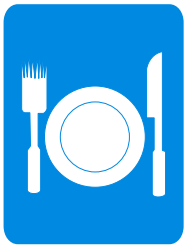
Female & Male



Female/Male Toilet DS



Fork, plate & knife



Restaurant



Restaurant DS

Figure 5.6.1.(Researcher's Construct)

The DS showsthe progression from ordinary signs, transformed to symbols and to directional signs (DS).

5.7. Studio-Developed Directional Signs for Jos metropolis



Figure 5.7.1: Airport Directional Sign
Source: Researcher's construct



Figure 5.7.2: Post Office Directional Sign
Source: Researcher's construct



Figure 5.7.3: Telephone Booth Directional Sign
Source: Researcher's construct



Figure 5.7.4: Restaurant Directional Sign
Source: Researcher's construct



Figure 5.7.5: Bus Stop Directional Sign
Source: Researcher's construct



Figure 5.7.6: Toilet Directional Sign
Source: Researcher's construct



Figure 5.7.7: No Parking Directional Sign
Source: Researcher's construct



Figure 5.7.8. Hotel Directional Sign
Source: Researcher's construct



Figure 5.7.9: Swimming Directional Sign
Source: Researcher's construct



Figure 5.7.10: Tea Shop Directional Sign
Source: Researcher's construct

Chapter6.SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1. Introduction

The chapter summarises the findings and conclusions drawn from the investigation carried out in an attempt to answer the research questions. Recommendations for further study have also been suggested.

The existing DS within the Jos metropolis were recorded and it was obvious that majority of the DS did not combined written text with graphic symbols. Out of the ten recorded DS in Jos metropolis, only one combined written text with symbol, the remaining nine were either “text only” or “symbol only”. Ten symbols were also presented to respondents and the written text of what the represented were juggled on the side of the paper for the non-literate and literate respondents to identify. Eighty-Eight percent of the non-literate respondents identified them correctly, while 98% of the literate respondents got them right. A total of 93% of respondents (non-literate and literate) identified the symbols correctly.

6.2. Summary of findings

This study assumed that the combination of graphic symbols and text as DS within Jos metropolis will communicate intended massage to non-literate and literate audience. Consequently, the research questions were constructed to enable the findings to achieve the objectives of the study.

6.3.Do the existing directional signs within the Jos metropolis conform to ISOTYPE standards and norms?

The existing DS within the Jos metropolis were recorded in the course of this investigation, out of the ten recorded, only 10% combined text and symbol. Thirty per

centhad “symbols only” and the remaining 60% had “text only”. It is therefore evidently clear that there are DS in Jos metropolis, but they non-literate persons in Jos metropolis might not be able to interpret 60% of the DS. Even though 30% had symbols only, which might make meaning to the non-literate, ISOTYPE however, encourages the combination of text and symbol, which represented just 10%.

6.4. Would directional signs that combine written text and graphic symbols be more effective in communicating intended public information to all, irrespective of language and literacy?

The result of this investigation collaborated with studies advanced by Neurath and Mayer (1990) who affirmed that the combination of text and symbol is an effective tool in communicating public information to all, irrespective of literacy level.They strongly suggested that such public symbols should be tested before putting them to use. This study therefore tested ten public symbols on non-literate and literate respondents in Jos metropolis. The result showed that 88% of non-literate respondents identified the symbols correctly, while 98% of the literate respondents also identified the symbols correctly. It is evident from this study that the non-literate respondents were able to identify and associate meanings to those symbols, even when they could not read what the symbol represent. Brumback (1995) postulatedthat when visual images and written text are combined, it becomes the principal form of communication across cultures and literacy levels. He went further to say, “We are heading to a culture of *visual literacy*.”

The findings of this study therefore that the combination of written text and graphic symbols as DS in Jos metropolis will effectively communicate intended public information to more people, irrespective of their language and literacy levels.

6.5. Major Findings of the Study

The main thrust of this study was to evaluate the communication effectiveness of DS that conform to ISOTYPE standards in Jos metropolis. In the course of the study, it became apparent that testing the three categories of DS: “text only”, “symbol only” and “text and symbol” would have provided an enhanced comparison of the communication effects on the respondents, that notwithstanding, the following conclusions were made:

i. The presence of DS within the Jos metropolis was undisputedly established. The DS as wererandomly recorded in this study, majority of the DS however, do not conform to ISOTYPE standards of combining text and graphic symbols.

ii. Even though there were DS within the Jos metropolis, their function of directing people to their various destinations, especially the non-literate and foreigners that could read in Englishlanguage is in question. This is because 90% of the recorded DS do not combine written text with symbols.

iii. Apart from not performing the communication function, the designers of existing DS within the Jos metropolis did not apply simple elements and principles of design. For example some of the types used wereinconsistent. Spaces in between letters and words were not equally distributed.

iv. The visual literacy level of the Jos metropolis, based on the result of the symbol identification test, was significantly high. The test revealed that 88% of non-literate identified the symbols correctly, while 98% of the literate respondents also got them right.

v. The need for proper education on iconicity of symbols was clearly observed. Some respondents, for example, the non-literate respondents could not easily associate the symbol for Ladies/Gents to represent a restroom for ladies/Gents. This could be attributed to the fact that the symbolswere

justsilhouetted figures of a standing female and male, and not depicting the figures squatting "*real act"*. This has given rise to the need for proper and deliberate enlightenment on the use of symbols and what they represent.

vi. As a developing city, with a lot of tourism potentials, the need to include way-finding design into the greater Jos metropolis design became apparent.

vii. The difference between the DS and signposts within the Jos metropolis was not significantly noticed.

6.6. Recommendation for Further Study

In the course of this study, it became clear that there was need to test the communication effects of the three categories of DS:"text only", "symbols only" and the combination of "text and symbol"on the non-literate and literate respondents in the Jos Metropolis.The importance and effect of colour in way-finding design and its cultural and geographical implications in Nigeria could also be an interesting area of study. There is also the need for deliberate effort to teach symbols are their meanings in developing cities like Jos metropolis. Another interesting area of study could be the perception of symbols of children from rural ethnic groups in Plateau State, with the aim of developing visual literacy level of the next generation. The world is fast growing into a global village, there is the need for further research to be carried out on how Nigeria as a nation can develop its unique symbolic icons that will harmoniseher multi-cultural diversities, with the aim of developing and promoting a common visual language that will be understood by many. This will serve as a unifying factor for this heterogeneous and multi-lingual society, called Nigeria. It could be her contribution to making the world... "a global village".

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QUESTIONNARE

Department of Industrial Design,
Ahmadu Bello University,
Zaria,
November 25, 2011

Dear Sir/Madam,

THE EFFECTIVENESS OF DIRECTIONAL SIGNS (DS) THAT COMBINE WRITTEN TEXT AND GRAPHIC SYMBOLS IN COMMUNICATING INTENDED PUBLIC INFORMATION IN JOS METROPOLIS.

I am a graduate student of Ahmadu Bello University, Zaria, specializing in Environmental Graphic Communication, in the Department of Industrial Design. This questionnaire is in part fulfillment of a research towards the award a Master Degree. It is designed to investigate the effectiveness of Directional Signs that combine written text and graphic symbols in communicating intended public information in Jos metropolis. As part of this study therefore, you have been selected among others to assist in answering questions related to the objectives of the research.

All information given will be held in confidence and will not be divulged to anyone in any way. Please kindly respond appropriately as contained in the instrument.

Thank You.

Sunday SajeGyang

Questionnaire

Section A

Personal data

Instruction: Kindly tick the appropriate responses in the box provided below

1. I reside in Jos ▱ I am a visitor ▱

2. Nationality: Nigerian ▱ Non-Nigerian ▱

3. I can read ▱ I cannot read ▱

Section B

Symbol identification test

Kindly look at the symbols below carefully, draw a line to what each symbol represent. See example below





Bus Park

Airport

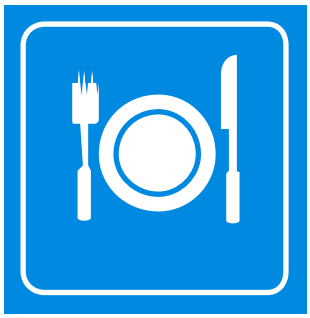
Post Office

Tea Shop

Hotel



Telephone



Post Office



Taxi Park



Restaurant



Hospital



Hotel



Bus Stop



Ladies/Gents



No Parking



Swimming Pool