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Textile Design As A Medium Of Education On Motor Accident In The Wa Municipality

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Abstract: ***The high rate of road accident is now becoming a global issue rather than a common concern in the Wa Municipality in the Upper West Region of Ghana. Motorcycle accidents cases are increasingly becoming alarming in the Municipality and most of the victims are in their active age and this includes students and children. It is therefore very necessary for the road user to know the various safety rules on the road as well as road regulations in order to minimize the situation. The study was in three phases namely the situational analysis phase, fabric design and production phase and the evaluation phase. At the situation analysis phase, it was discovered that the main causes of motor accident in the Wa Municipality are lack of experience, the use of mobile phone while riding, mechanical issues, careless riding and poor knowledge of road signs. This information influenced the designing and production of the fabric. The purpose is to use textiles design as a tool of communication to educate road users on road safety measures. After evaluation, it was discovered that the use of the designed fabric as medium of education on road safety proved successful.***

Keywords: motif design, fabric design, motorcycle accident and road signs

I. INTRODUCTION

Motorcycles are increasing worldwide, particularly in developing countries like Ghana. One of the fastest developing municipalities in the Upper West Region of Ghana is Wa, where majority of people use motor cycle as means of transport.

Motorcycles play significant roles in lives of people in the Wa Municipality. As means of transport they imparts positively on the welfare of individuals in terms of access to health facilities, commuting people to work, market, farms, schools and many other places. It serves as source of income for commercial users who serve in various capacities to make life easy and pleasant for the populace.

It is generally agreed that commuting with motorcycle is easier, faster with no traffic situations and fuel efficient. It offers lower cost of maintenance and able to go anywhere including the remotest village.

In spite of all these benefits, the use of motorcycle has posed serious problems in the Wa Municipality. The Upper West regional commander of the motor traffic and transport union expressed concern about the spate of fatal accidents involving motorbike users in the Municipality. He confirmed that out of the 43 reported cases of accidents as at the third quarter of 2016, 27 were motorbike related accidents. Though the number of motor accidents reduced from 43% in 2008 to 27% in 2009, deaths from the accidents rose from 23% in 2008 to 24% in 2009, while 32% of people sustained serious injuries through motor accidents in 2009 as against 30% in 2008. There were about 778 injuries and fatalities from various road traffic accidents reported to Motor Traffic and Transport Unit (MTTU), of the Ghana Police Service in the Wa Municipality between 2008 and 2013, which resulted in

millions of Cedis in hospital charges and damages at the expense of the state (Sebiawu, et al 2014).

The situation is getting worse in recent time and this call for urgent attention. It is against this background that this study aimed to find out the major causes of motor accident in the Wa Municipality and to use textile designs as a tool to educate motorists and the general public on road safety to augment the work of the National Road Safety Commission.

VISUAL COMMUNICATION

The human brain has two parts with different attributes which respond to different stimuli. The left side of the brain is associated with logic, responding better to textual material, whilst the right is more imaginative and responds more to visual imagery (Haustman, 2002). In their study on *The Role of Pictures in Improving Health Communication*, Houts, Doak, Doak and Loscalzo (2005) observed that pictures closely linked to text can, when compared to text alone, markedly increase attention, comprehension, and recall of health education information. This agrees with McGuire's (1999) conclusion in a study that adding pictures to written and spoken language can increase patients' attention, comprehension, recall and adherence. According to Hyerle, (2000) studies revealed that 90% of what the brain processes is visual information. This is supported by The Neuroscience of Learning (2010) stated that the brain machinery is highly efficient in storing and recalling visual information.

Designers all over the world have taken advantage of these scientific discoveries by combining text and images (pictures) on purpose to gain viewers' attention, comprehension, retention and adherence to information. The use of visual communication benefits a wider range of people such as individuals with low literacy skills and language barriers (Houts et al, 2005).

COMPUTER AIDED FABRIC DESIGN

To produce effective fabric designs that will be communicative enough to cause change in behavior leading better quality of life, *Visual Communication* should be adopted. This is achieved in textiles design through the use of pictorial motifs designs. Design, which is an integral part of production, according to Bessant (2002) is the process and the result of giving tangible form to human ideas. Darlie K. (2011) states that a design is the systematic transformation of ideas into reality that constitutes and *contributes* to the quality of life.

Today computers are omnipresent, affecting every aspect of our lives. Textiles have not escaped their influence and this is seen everywhere, from the use of computer-aided design (CAD) for structural or decorative purposes to printing (Braddock & O´Mahony, 2005). Using CAD allows designers to develop even newer design ideas and show the components in every design. CAD helps to come out with good prototype and gives the designer more flexibility in the area of colour rendering and effecting changes on a product.

CAD allows textile designers to view designs of clothing on virtual models and in various colours and shapes, thus saving time by requiring fewer adjustments of prototypes and samples later. Computer software helps create motifs, textures, patterns, adjust sizes and even determine fabric colours. CAD is therefore instrumental in designing fabric to promote road safety.

The Ghana National Road Safety Commission (1996) classified road signs into three:

a. CAUTIONARY/WARNING SIGNS

These road signs warn road users in advance of the existence of certain hazardous conditions. Warning signs have the shape of equilateral triangle with apex pointing upwards, red borders and black symbol on white background.

b. MANDATORY/REGULATORY SIGNS

These road signs inform road users of law and regulation they have to abide by. Violation of these signs is a legal offence. Mandatory signs are also generally circular shapes except for the STOP (Octagonal)

c. INFORMATORY SIGNS

These are for providing information and guidance to road users. The informatory signs are generally rectangular shape.

Road Accident

The National Road Safety Commission (NRSC, 2016) has expressed great worry over the rise in the number of road crashes especially in 2016. The Commission, as of the end of November 2016, had recorded a total of 11,378 road crashes countrywide involving 17,746 vehicles, of which the total number of casualties stood at 12,154 comprising of 1,990 deaths and 10,154 injuries. Compared with those recorded during the same period in 2015 the total number of reported cases showed increases of 14.88% in road crashes, 14.45% in number of vehicles,, 33.74% in deaths and 20.19 % in injuries respectively.

According to Enu (2012) the major causes of road traffic accidents in Ghana include gross indiscipline on the roads, parking at unspecified bus stops to pick up passengers, receiving calls whilst driving , over-loading, fatigue driving, drunk driving and over speeding. The poor nature of some of roads, non-observance of traffic rules and regulations by most drivers, poor maintenance of vehicles and indiscriminate use of the road by some pedestrian are some of the other causes of motor and car accidents in the country. The general causes of motor accidents have been grouped into *mechanical factor*, *general human error*, and e*ngineering factor* (The National Road Safety Commission of Ghana, 2016).

While some cities record more car accidents than motor accidents, it is vice versa in the Wa Municipality. Most people in the Wa Municipality prefer motorbikes because of its mobility, speed and affordability of fair and because it is inexpensive as compared to vehicles. This agrees with an observation in another study which says:

The number of motorcycles has increased especially in large urban areas possibly due to increasing fuel costs, intense traffic and low purchase price for motorcycles.

Despite being considered dangerous, motorcycles are an attractive and cheap option for leisure and/or work, particularly in urban areas (Carrasco et al; 2012).

WA MUNICIPALITY (THE STUDY AREA)

Wa Municipality is located in the Upper West Region of Ghana. The Region is the youngest of the ten (10) region of Ghana. It was created in 1983 with its main capital town being Wa. The Wa Municipality is among eleven (11) Municipalities and Districts Assemblies located within the Upper West Region. It is the administrative capital of the Region. The population of Wa Municipal, according to the Ghana Statistical Service (2012), is 107,214 representing 15.3% of the region's total population. The Wa Municipality is the largest urban centre and the hub of commercial activities in the Upper West Region. It is dominated with Moslems and Christians whose main occupation is farming.

II. RESEARCH METHOD

The study which depended on observation, questionnaires, interviews and photographs for data collection is descriptive and explorative in nature. The simple random sampling was adopted on purpose to have a sizable number of respondents. A total number of one hundred and eighty (180) respondents - one hundred and twenty (120) students from three institutions (Jahan College of Education, Wa Polytechnic, University for Development Studies) and sixty (60) individuals including commercial motorcycle users and passengers formed the sample size of the study. The research was conducted on three phases: the situation analysis phase, fabric design and production phase and the evaluation Phase.

THE SITUATION ANALYSIS PHASE

At the situation analysis stage, data was collected from respondents on the major causes of motorcycle accidents in the Wa Municipality. This was to inform the researchers on the elements and principles of designs to use for effective communication. For purposes of motif design, photographs of everyday practices of road users were taken.

FABRIC DESIGN AND PRODUCTION PHASE

Haven gathered substantial amount of data, many designs were executed primarily based on the data. Computer software such as Adobe Photoshop, CorelDraw and Adobe Illustrator were used for the fabric designs. Photographs taken on the field were imported into the software and converted to vector format for easy manipulation for better design effects.

EVALUATION PHASE

To ascertain the effectiveness of the designed fabrics as means of education, a survey was conducted. The main purpose of this is find out

- ✓ If the designs in the fabrics had educated the users and the viewers on road safety. Do the designs communicate the expected information?
- ✓ If there is positive change in the behaviour of road users.
- ✓ If motorist would accept to use the designed fabrics as 'Friday wear' and road safety advocates.

III. DISCUSSION OF RESULTS

THE SITUATION ANALYSIS PHASE

Data collected revealed that there was heavy reliance on motorcycle as means of transport. An overwhelming 95% of respondents admitted that they had ever used motorcycle before and 53.3% of them had reported that they had their personal motorcycles. The rest of the 31.7% of respondents represented those who patronize the services of *motorcycle and tricycle* riders; those who used bicycle and, in rare cases, those who board taxies. It is important to establish here that some percentage of those who owned their personal motorcycles; some of those who patronize motorcycle services and taxi users also had their personal bicycles. According to them their choices of transport, at every given point in time, depended greatly on where they were going, time factor and distance to be covered. The low patronage of taxi services is principally because most of the people in the Municipality were low income earners and considered taxi fares to be too expensive. Again, the people resorted to the use of motorcycle, tricycle and bicycle because they considered these means most convenient given the bad nature of roads linking the various towns and villages.

CAUSES OF MOTOR ACCIDENTS IN THE WA MUNICIPALITY

There are numerous causes of motor accident in the Wa Municipality but these had been put into four (4) categories which is human error, mechanical problem, nature of road and other causes. This is indicated in the table below;

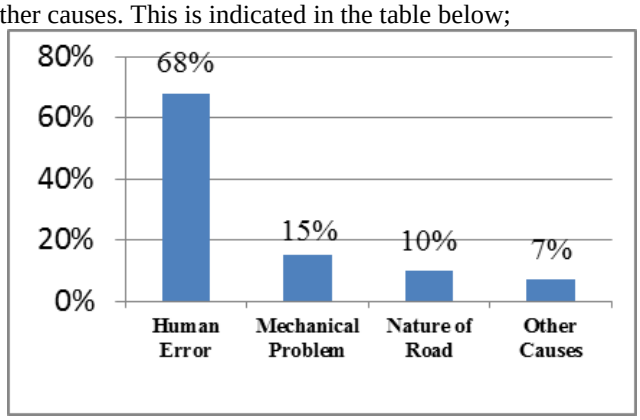

Table 1: Causes of motor accidents in the Wa Municipality

A high proportion of respondents (68%) surveyed in this study rated accidents caused by human error as most frequent. This includes over speeding, disregard for road signs, careless riding, overloading, wrong overtaking, and the use of cell phone while riding. This agree with Nkede's (2009) statement that two-third (2/3) of accidents in most African countries are due to inattention, excess speed and overloading which he

referred to as *human causes*. The mechanical problems are related to brakes, acceleration, clutches and gear (transmission system), and engine issues. Most of these mechanical problems, according to respondents, are due to poor maintenance practices. Some respondents (10%) were of the view that the condition of roads in the Municipality also contribute to motor accident. Some portions of the road were in bad state. This is probably because most of the roads have not been rehabilitated for a very long time while other untarred roads linking the various villages were generally in bad condition especially during the raining seasons.

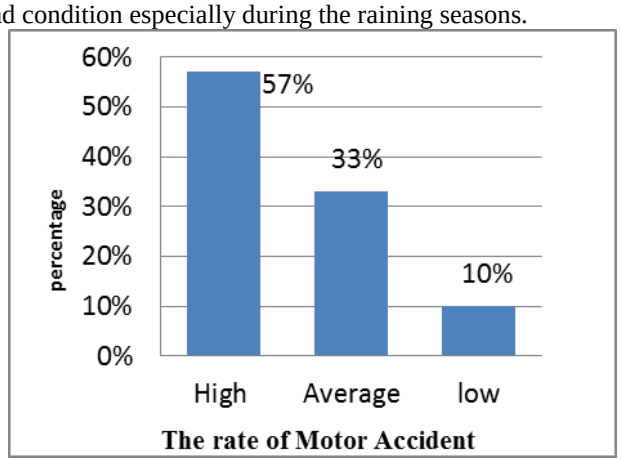

Table 2: Respondents' view on the rate of accident in the Wa Municipality

On purpose to examine the respondents view on the *seriousness* and level of concern with regard to motor accident in the Wa Municipality, they were asked to rate it high, average or low. Fifty seven percent (57%) of respondents considered accident rate to be high and 33% thought it was average. The variation in the respondents' view may probably depend on how long he or she stayed in the Wa Municipality and how often he or she heard of motor accidents. In any case, there is an expression of great concern in respect to the 57% high rate and 33% average rate which called for attention.

THE USE OF HELMET

While 98% of respondents agreed that it was necessary to use crash helmet, only 35% admitted that they used helmet when riding. Meanwhile it was detected during an observation that less than 35% of motorists used helmet and in cases where a rider is using a helmet, the passenger is left unprotected.

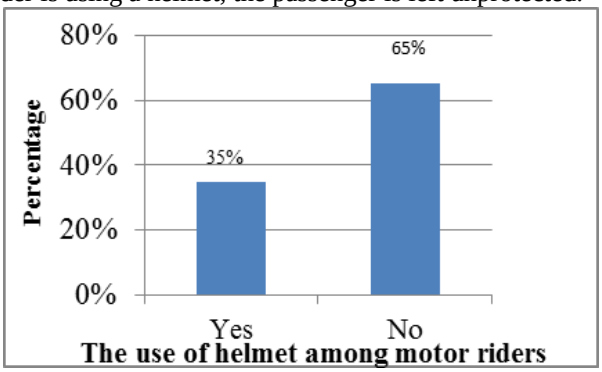

Table 3: Responses on whether riders use helmet or not

Injuries to the head and neck are the main cause of death, severe injury and disability among users of motorcycles and bicycles. In some low-income and middle-income countries head injuries are estimated to account for up to 88% of such fatalities (Umar, 2002). The social costs of head injuries for survivors, their families and communities are high, in part because they frequently require specialized or long term care. Head injuries also result in much higher medical costs than any other type of injury. According to Umar (2002), the rapid growth in the use of motorcycles in many low income and middle-income countries is already being accompanied by a considerable increase in the number of head injuries and fatalities that will only continue to increase if present trends continue unchecked.

FABRIC DESIGN AND PRODUCTION PHASE

The research finding reveals certain causes of motorcycle accidents in the Wa Municipality. These causes were the key factors that influenced the fabric design in terms of motif designs and fabric textures. Pictures taken from research field and other symbols and images relevant to the study were used. The following are the steps the researchers followed in developing all design concepts.

DESIGNING THE CLOTHS

STAGE ONE

Pictures taken on the research field were edited and rendered in thumbnail sketches using CAD (Computer Aided Design) software known as Adobe Photoshop. The pictures were carefully selected to give the right message the researchers intended to communicate to motorist and other road users in the Wa Municipality. Because the photographs were in *jpeg* file format and could not be edited, they were converted to vector format and were rendered black for easy editing. Appropriate colours were then applied to the images with background textures. Below are the motif development stages for the first fabric.

Plate 1

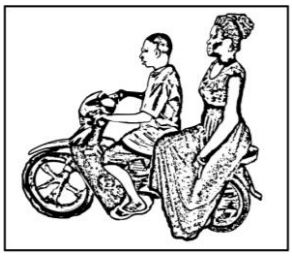

Figure 1

Plate 1: A photograph (in jpeg) dipcting improper sitting on motorcyle. (Source: field survey)

Figure 1: Picture rendered in black vector mode

Plate 2: A motif designed from the original photograph with different colours

STAGE TWO

Appropriate fabric textures were designed and applied to the background to enhance the design. The textures design concept was derived from mechanical component of motorcycle.

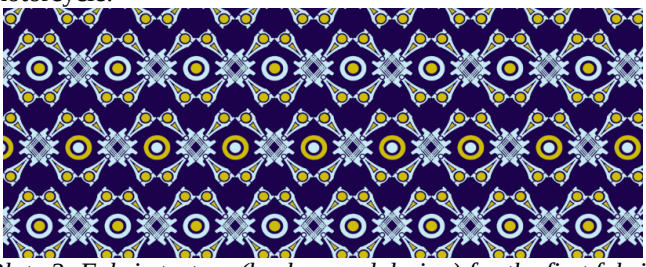

Plate 3: Fabric texture (background design) for the first fabric

STAGE THREE

The next stage of the design process involves the arrangement of motifs on the fabric background. Individual motifs were arranged in full drop, half drop, tossed, linear (vertical and horizontal), and random order. *Plate 4 and 5* shows a finished fabric design with pictorial motifs and textures in two colour-ways. This design aimed at discouraging improper sitting on the motorcycle. These three stages of design were followed for the designing of the rest of the fabrics.

Plate 4 and 5: Final fabric in two colour-ways

DESIGNING THE SECOND CLOTH

Below are the motifs used in designing the second cloth;

Plate 6: A crash helmet with the inscription 'Always put on your helmet, no excuses"

Figure 2: Silhouette of a motor rider facing right and left directions

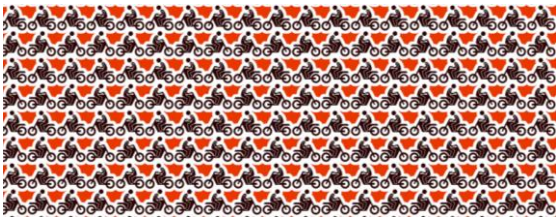

Plate 7: Fabric texture (background design) for the second fabric

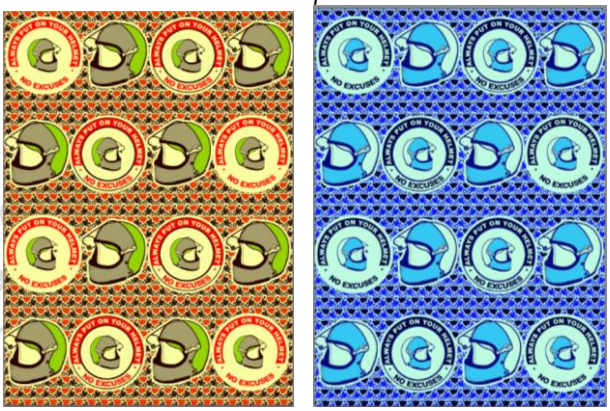

Plate 8 and 9: Final fabric in two colour-ways

DESIGNING THE THIRD CLOTH

Below are the motifs used in designing the third cloth;

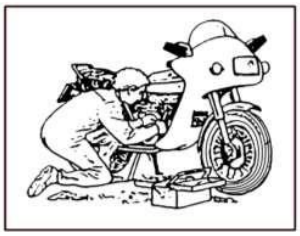

Figure 3

Plate 10

Figure 3: A vector image of a motorcycle repairer
Plate 10: Image renderend in colour to be used as motif

Plate11: Inscription used in the third cloth

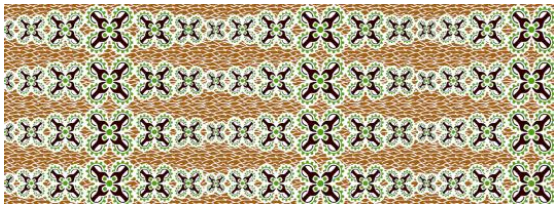

Plate 12: Fabric texture (background design) for the third fabric

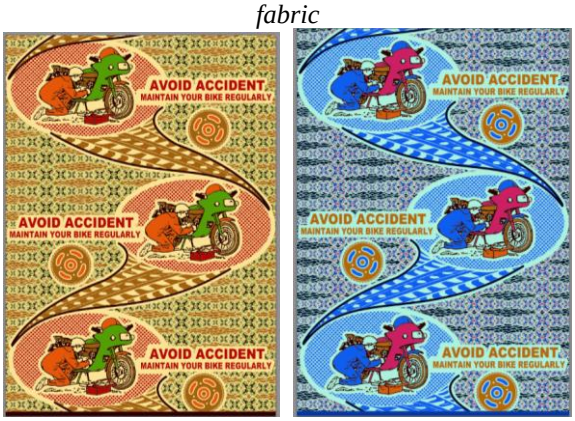

Plate 13 and 14: Final fabric in two colour-ways

DESIGNING THE FOURTH CLOTH

Below are the motifs used in designing the fourth cloth;

Figure 4

Plate15

Plate 16

Figure 4: A vector image of a rider making call whiles riding
Plate 14: Image renderend in colour to be used as motif
Plate 15: "No calls when riding" sign

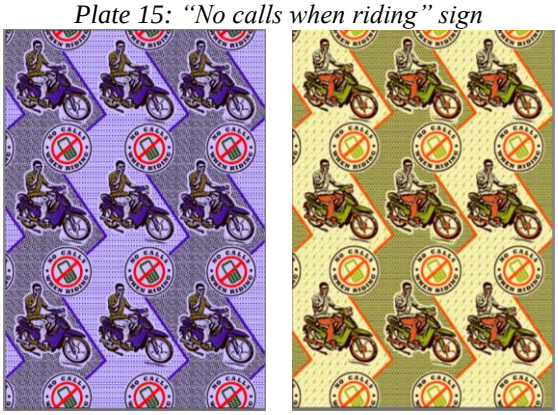

Plate 17 and 18: Final fabric in two colour-ways

DESIGNING THE FIFTH CLOTH

Below are the motifs used in designing the fifth cloth;

Figure 5

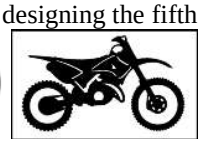

Figure 6

Plate 19

Figure 5:Riding without a license is an offence
Figure 6: Silhouette of a motorcycle
Plate 19:A hand showing the inscription "Riding without a license is an offence"

Plate 20: Fabric texture (background design) for the fifth fabric

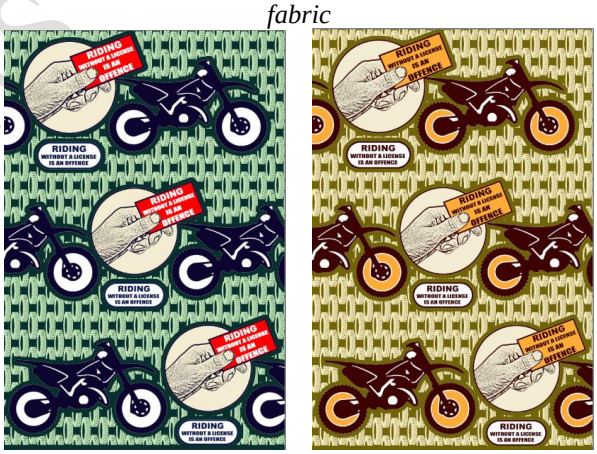

Plate 21 and 22: Final fabric in two colour-ways

DESIGNING THE SIXTH CLOTH

Below are the motifs used in designing the sixth cloth;

Plate 23: An inscription used as motif for the cloth

Plate 24: Samples of Road Signs used as motifs for the cloth

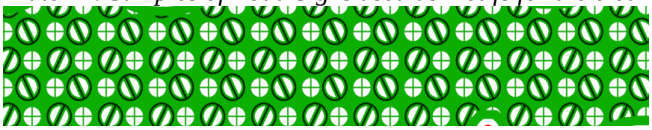

Plate 25: Fabric texture (background design) for the sixth fabric

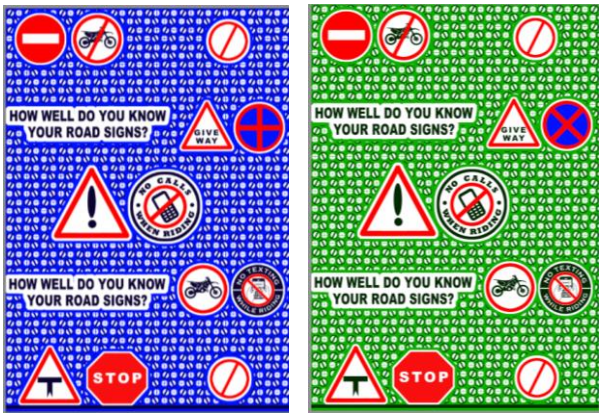

Plate 26 and 27: Final fabric in two colour-ways

EVALUATION PHASE

This phase was necessary to test the success level of the designed fabric. Basically, the assessment is to find out if the designs are suitable to educate people on motor accident; if they are communicative enough to result in positive behavioural change of road users and whether the designed fabrics could be adopted as "Friday wear" for motorist. The completed designs were printed on fabric and samples of these printed fabrics were used during the evaluation for respondents to have tangible experience and give constructive responses.

Question	Majority Response	Percentage
Are the motifs in the fabric designs appropriate to educate the public on motor accident?	Yes, all the designs are relevant and appropriate to educate on motor accident.	82%
Do you think the fabric designs are communicative enough to cause positive change in the behavior of road users?	Yes, the messages being communicated are clear with the aid of the images, symbols and texts.	76%
Would you accept that these fabric designs be used as *'Friday Wear'* by motorists and other road users as campaign against motor accident?	Yes, using them as *'Friday wear'* will be a constant reminder to all road users.	91%

Table 4: Respondents' evaluation on the finished designed fabric

The table above shows an assessment survey carried out by the researchers on the various designs produced. Even though the questions asked were more than three they were summarized under the three questions as seen in *Table 4* for better presentation and analysis. These respondents include students, workers, motorist, passengers and some members of the general public on the street of Wa. The responses confirm that;

- ✓ Relevant images and road signs were incorporated into the design. Both literates and illiterates can interpret them. This, according to the respondents, will promote effective public education on motor accidents.
- ✓ The use of texts (words) together with images makes the designs communicative enough to cause positive behavioural change that will promote safety on the roads. This agrees with the assertion of *Houts,* Doak, Doak and Loscalzo's (2005) that pictures closely linked to text can markedly increase attention, comprehension, and recall of education information.
- ✓ A great number of respondent (91%) support the use of the produced fabric as "*Friday Wear"* by motorist to serve as a constant reminder to all road users about the need for safety on the road.

VI. CONCLUSION

Majority of motor accidents on the road was caused by human errors; over speeding, disregard for road signs, careless riding, overloading, wrong overtaking, and the use of cell phone while riding. These resulted in loss of lives, damages of properties and sometimes permanent disability which results in social and financial burden to the individuals and their families.

Dependence on road signs alone is not yielding positive results with regards to safety on the road. An alternative approach such as the use of the fabric designed will help augment the efforts being made by law enforcement agencies.

V. RECOMMENDATION

Haven examined the motorcycle accidents in the Wa Municipality, the following recommendation are made:

- ✓ There should be quarterly or biannually seminars and awareness raising programs for road users especially on campuses on causes and prevention of motor accidents and their social and financial implications on individuals and the nation at large.
- ✓ There should be strict enforcement of traffic regulation on the riders by the law enforcement agencies. They must also ensure that only riders who pass riding test with licenses are allowed to operate on the road.
- ✓ Introduction of the use of Crash Helmet programmes will be important to policy-makers in Africa, where there is an increasing use of motorcycle.
- ✓ Those who use motorcycles for commercial purposes should be trained on the rules and regulations governing its use.
- ✓ Joint stakeholder collaborative efforts should be intensified in order to promote road safety in the Municipality.

Coupled with all the above measures, the designed fabrics should be adopted as 'Friday wear' by motorists and road safety advocates to promote road safety.

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