



## Awareness of and Compliance of Pedestrians with Road Signs in Obafemi Awolowo University Community Ile-Ife (Nigeria)

*Prise de conscience et respect par les piétons de la signalisation routière sur le campus de l'Université Obafemi Awolowo, Ilé-Ifé (Nigeria)*

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### Abstract:

The research studied the awareness and compliance level of road users to road signs in Obafemi Awolowo University (OAU) community. Both primary and secondary data were used for the study. The primary data was obtained with well-structured questionnaire which was administered to the sampled population, the target population were pedestrians. Sample size formula was used to get the sample size used. The primary data was analysed with the SPSS software. ArcGIS was used to produce a map of road signs in the study area. The secondary data comprised the topographic map of the study area. The study observed that 73.72% of pedestrian in the study are aware of road signs but the compliance level is very low (37%). The study concluded that when there is proper understanding of and compliance with road signs either by sanctions or by willingness on the part of road users, the roads will become user-friendly.

### Résumé:

La recherche a étudié le niveau de sensibilisation communautaire et de conformité des usagers de la route à la signalisation routière à Obafemi Awolowo University (OAU). Les données primaires et secondaires ont été utilisées pour l'étude. Les données primaires ont été obtenues à l'aide d'un questionnaire administré à la population échantillonnée. La population cible est constituée de piétons. La formule de calcul de la taille de l'échantillon a permis de déterminer l'échantillon utilisé. Les données primaires ont été analysées avec le logiciel SPSS. ArcGIS a été utilisé pour produire une carte de la signalisation routière dans la zone d'étude. Les données secondaires comprennent la carte topographique de la zone d'étude. Les conclusions de l'étude indiquent que 73,72 % des piétons ne sont conscients de la signalisation routière et que seuls 37% la respectent. L'étude a conclu que dès lors qu'il y aura une bonne compréhension et un respect de la signalisation routière, soit par des sanctions soit par la volonté des usagers de la route, les routes deviendront conviviales.

### Keywords / Mots clés

*Awareness, Compliance, Pedestrian, Road Signs, OAU  
Sensibilisation, respect, piéton, signalisation routière, l'OAU*

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## INTRODUCTION

Among The Nigeria Highway Code defines a road as "a path established over land for the passage of vehicles, people, and animals". It provides dependable pathway for moving people and goods from one place to another (FRSC, 2008). The nature of the road can be so complex as there are so many types of roads such as private drive pathways, two-lane highways, dual carriageways, expressways, all having their complexities, such as T-junctions, roundabouts, interchanges, intercessions, U-turns, etc. In order to make the use of the road so easy therefore, different traffic signs that form part of the road education are presented to serve as road user's guide.

Traffic signs are the oldest and most commonly used traffic control device. These signs convey messages in words and or symbols and are put up to regulate, warn, or guide the road

users (Makinde and Opeyemi, 2012). Traffic signs are commonly used traffic safety tools, mainly developed to provide essential and important information in a short time to support safe driving; but the success depends on their comprehensibility by the drivers. According to Dewar and Olson (2002), traffic signs are used to provide information to regulate, warn and guide road users in a traffic system. Traffic signs are in different forms, portraying different meanings and giving different instructions per time to the user. There are directional signals, prohibitive signals, regulatory signals, warning signals, etc. Road signs generally help to make driving experience worth the while and provide safety to all road users.

As opined by Tom and Granié (2011), previous studies have shown that, among pedestrians, males violate rules more often than females do (Latrémouille et al., 2004; Moyano Diaz, 2002; Rosenbloom, 2009; Rosenbloom et al., 2004; Yagil, 2000) and

they concluded that the temporal crossing compliance rate is lower among male pedestrians but spatial crossing compliance does not differ between genders. Also, that different gaze patterns emerge between genders before and during crossing, notably as women particularly focus on other pedestrians during these two periods whereas men focus on vehicles and that females' gazes vary with the type of crossroads, but males' gazes do not. However, this study contrary to Tom and Granié's is not a gender study but rather looking at pedestrians' compliance to traffic rules generally. Glász and Juhász (2017) observed in Hungary that 91.9% of pedestrian accidents happened in built-up areas, however only 35.6% of the accidents were caused by pedestrians while on the road, in 60.8% of the cases, the pedestrian was the suspected offender. The most common fault caused by pedestrians is "incautious, sudden downstep".

Recent research has shown that in developing countries like Nigeria, deaths caused as a result of road fatalities are higher than its cause from other forms such as diseases and natural disasters. Traffic safety has significantly raised concern in public health in Nigeria since the first road crash in Lagos in 1906, as deaths from road accident markedly surpass combined deaths from 35 notable diseases which include the fatal HIV/AIDS and malaria (Arosanyin et al., 2013). The cause of road crashes some believed it is the poor management of vehicles on the road while others believed it is the poor state of the roads. While all of these may be true, the one thing that is common in most developing countries causing major road accident is the use of the roads by pedestrians and drivers alike because most road users are not conscious or even aware that there are rules that guide the use of roads. Rosenbloom et al. (2009) noted that drivers' attitude or behaviour remains a significant challenge facing the traffic safety community. Globally about 1.2 million lives are lost to road crashes annually, which mostly are resultant effect of poor driving behaviour, poor state of traffic infrastructure and weak enforcement of traffic regulations (Olusiji, 2011). The Irredeemable loss of dear ones on the other hand cannot be computed in numeric terms making the need to critically examine safety issues a key factor in the Nigerian road safety crisis. This study therefore seeks to determine the level of awareness of and compliance with road and traffic signs by pedestrians in order to curb road accidents in the study area. Though many researches has been done by different researchers especially in Nigeria, these has been on the drivers and not on the pedestrians, this study therefore bridges the gap on the involvement of pedestrians in reducing road crashes.

Compliance theories provide accounts of why different groups comply with or do not comply with laws, either domestically or internationally. These theories are useful lenses for viewing and understanding compliance-related behaviour and the reasons behind the behaviour. As such they suggest different approaches that institutions can use to influence firms or individuals to comply with laws. Theories of compliance can be grouped into two categories, thus: "Rationalist" models that focus on deterrence and enforcement as a means to prevent and punish non-compliance by changing the individual's calculation of benefits and cost; and "Normative" models that focus on cooperation and compliance assistance as a means to prevent non-compliance. March and Olsen (2002) divide the basic logic of human actions into the "logic of consequences" and the "logic of appropriateness". The "logic of consequences" views an individual as choosing rationally among alternatives based on

their calculations of expected consequences whereas the "logic of appropriateness" sees action based on identities, obligation and conceptions of appropriate action (Mitchell et al., 2005).

This study generally mapped all points with road signs in the study area; determined the level of awareness of road signs by pedestrians in the study area; and also determined the level of compliance of pedestrians to road signs.

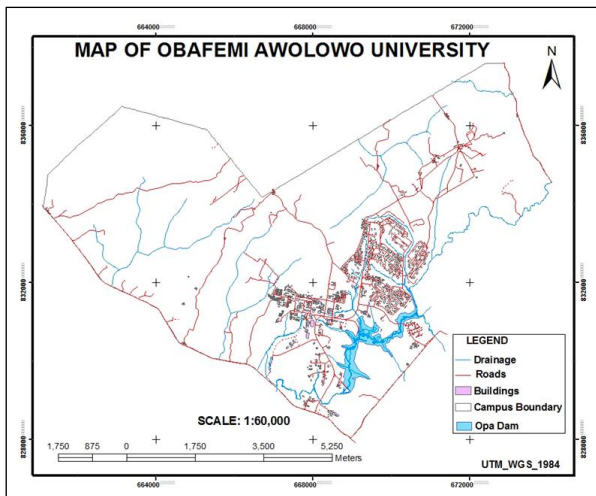
## THE STUDY AREA

Obafemi Awolowo University (OAU) is located in the ancient town of Ile-Ife in Ife Central Local Government Area of Osun state, Nigeria. The University lies between latitudes 7032'N and 7033'N and longitudes 4°31'E and 4032'E (see figure 1) and covers about 5,000 acres of land with about 35,000 students (Obafemi Awolowo University, 2013). Obafemi Awolowo University was established in the year 1961 upon recommendation of a Commission headed by Sir Eric Ashby, Master of Clare College Cambridge, in 1960 on the need to establish more universities aimed at meeting the demand for high level manpower in the newly independent state – Nigeria. The university took off as University of Ife but was taken over by the Federal Government of Nigeria and christened after the first premier of the Western Region and the founding father of the University, Chief Obafemi Awolowo, in 1987 (Obafemi Awolowo University, 2011).

Transportation is a major source of livelihood for a good number of the population of Ile-Ife. The residents of Ile-Ife engage in commuting activities both within and among communities. The Ile-Ife community also runs public bus and motorcycle transportation into and within the Obafemi Awolowo University community.

The university has a well-structured road network built to standard. The transport services within the university are relatively cheap and well organized. The major forms of transports aside the pedestrian mode of movement, are the mass use of bus (popularly called "town-gboro"), the employment of motorcycle locally called "Okada" for commuting which is increasingly being demanded for evident in the rapid increase in number of motorcycles. Cars are mostly used by private owners mostly lecturers and staffers of organizations that have their offices within the university and there is no use of three-wheelers yet within the university.

Traffic safety signs (road signs) are practically available in major areas within the halls of residence and academic areas. Infrastructure such as parking lots, traffic light, pedestrian crossing, pedestrian walkway, clearly defined bus stops are observable within Obafemi Awolowo University. All vehicles are by law required to be registered with the Federal Government of Nigeria. In like manner, the university management requires all vehicles plying the campus to be duly registered with the school security force alongside a detachment of the federal road safety corps, which are the bodies saddled with ensuring compliance to traffic rules within the university premise.



Source: Author's digitized map  
 Fig. 1: Obafemi Awolowo University Ile-Ife, Nigeria

## MATERIALS AND METHODS

### DATA COLLECTION AND ANALYSIS

Results Primary and secondary data were used for this research. A well-structured questionnaire was administered on the pedestrians to inquire on their knowledge of road use and their compliance with it. A total of 137 copies of the questionnaire were administered on and retrieved from the pedestrians who thus form the sample size for this study. The questionnaire seeks knowledge of awareness from the pedestrians. Some pedestrians were selected from halls of residence where road signs can be seen (Angola, Mozambique, Awolowo annex, Moremi, Fajuyi annex and Akintola). Some were also selected on contact around where road use is high and where road signs can be seen.

Personal observation was likewise conducted with a video camera during the mornings and evenings (between the hours of 7-9am and 5-7pm respectively) to see how people (workers and students) use the road when they are being watched or compelled to obey traffic rules and when they are not being watched or compelled to obey traffic rules. The observation was conducted with targeted areas in mind. The targeted areas were areas within the study area where road use is very high. Geographic coordinates of Road signs in the study area were obtained using a hand held Global Positioning System (GPS) receiver. Secondary data was topographical map of the study area which was used as a base map for the study.

The data gotten from the questionnaires were analysed using Descriptive analysis techniques. Descriptive statistical tools such as tables, charts and simple percentages were used to represent the data gotten. Inferential statistics such as a Cross-tabulation of pedestrians' knowledge of and obedience to road signs; chi-square analysis to determine the correlation between awareness and compliance to road signs was also carried out. ArcGIS was used to create a map of road signs from the coordinates of the road signs gotten from the use of the GPS receiver to check the distribution pattern.

## RESULTS AND DISCUSSION

### PEDESTRIANS' AWARENESS OF ROAD SIGNS

Here we discuss pedestrian responses on their awareness of road signs as shown in tables 1 and 2; however, before discussing the awareness, the availability of road signs in the study area is examined below.

### AVAILABLE ROAD SIGNS IN OAU

Figure 2 shows a map of the distribution of road signs across road network in the study area. The map was produced using the ArcGIS software. Coordinates were gotten using a hand held Global Positioning System (GPS) receiver. The map shows a cluster of the road signs on Road 1 and Road 2 of the study area. The reason for the cluster could be attributed to the fact that these two roads are the busiest roads in the study area. The Road 1 connects the main entrance of the University to the main campus, stretching about 1.8 km. Road 2 connects other part of the campuses and to the halls of residence and other places in the academic area.

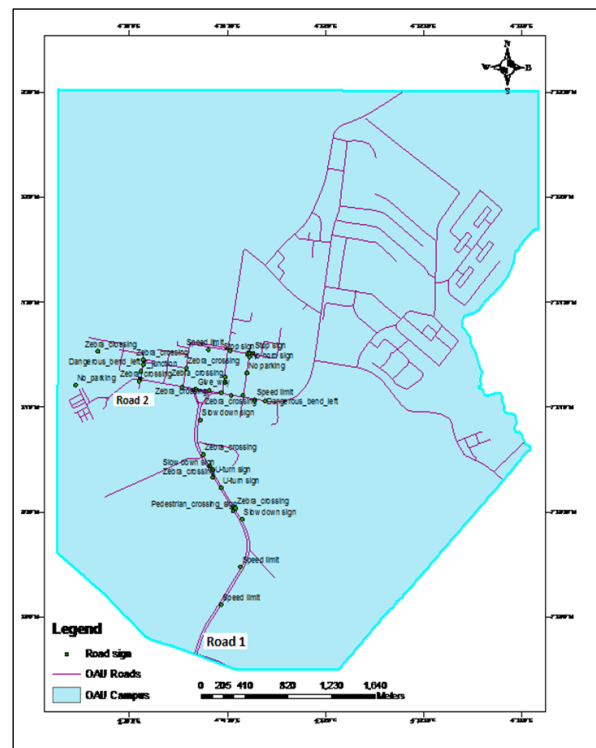


Fig. 2: Map showing location of road signs on OAU campus

### ROAD SIGN AWARENESS OF PEDESTRIANS AND PERCEPTION OF PEDESTRIANS ON PEDESTRIANS' AND DRIVERS' KNOWLEDGE OF ROAD SIGNS

Out of the 137 respondents that questionnaires were administered to, 70 (51.1%) always noticed the road signs on campus. 77.4% of them do not agree that drivers alone should have knowledge of road signs, 91.2% of the respondents are of the opinion that pedestrians should also have knowledge of road signs, and another 94.9% agree that not only should they have the knowledge but that they should also obey them while 4.4% felt indifferent to this (see table 1).

65% of the respondent picked the option of walking facing traffic as the part of the road to walk on while majority 85.4% believe that zebra crossing should be used when available and

42.2% of the respondents also believe that it is not necessary to wait for pedestrian light before crossing.

S/No	Variables	Attributes	Frequency	Percentage Frequency (%)
1	How often does respondent notice road signs on campus	Always	70	51.1
		Rarely	57	41.6
		Occasionally	8	5.8
		Never	2	1.5
		<b>Total</b>	<b>137</b>	<b>100.0</b>
2	Does respondent think drivers alone should have knowledge of road signs	Yes	26	19.0
		No	106	77.4
		Indifferent	5	3.6
		<b>Total</b>	<b>137</b>	<b>100.0</b>
3	Does respondent think pedestrian should have knowledge of road signs	Yes	125	91.2
		No	5	3.6
		Indifferent	7	5.1
4	Does respondent agree that they should obey them	I agree	130	94.9
		I disagree	1	0.7
		I'm indifferent	6	4.4
		<b>Total</b>	<b>137</b>	<b>100.0</b>
5	Which side of the road does respondent walk on	Backing traffic	6	4.4
		Facing Traffic	89	65.0
		Either side	13	9.5
		Whichever is convenient	28	20.4
		No response	1	0.7
		<b>Total</b>	<b>136</b>	<b>100.0</b>
6	How often should respondent use zebra crossing if present	Always	117	85.4
		Rarely	17	12.4
		It doesn't matter	3	2.2
		<b>Total</b>	<b>137</b>	<b>100.0</b>
7	Should respondent wait for pedestrian light to turn green before crossing	Always	32	23.4
		Sometimes	58	42.3
		Rarely	26	19.0
		I have not noticed on campus	21	15.3
		<b>Total</b>	<b>137</b>	<b>100.0</b>

Source: Field Survey, 2016

Table 1: Road sign awareness of pedestrians and perception of pedestrians on pedestrian's and driver's knowledge of road signs

#### AWARENESS OF SELECTED ROAD SIGNS AND THEIR CORRECT INTERPRETATION FOR PEDESTRIANS

Road signs that pertain to pedestrian are not as much as those that pertain to motorist in the study area. Six signs were selected and the respondents' knowledge of these signs was tested. The signs were the:

1. Pedestrian crossing sign
2. Traffic light
3. Zebra crossing
4. Pedestrian light
5. T-junction

The results as shown in Table 2 reveal that respondents have noticed all of the signs and in high percentage too except the T-junction sign that has an average awareness. Respondents correctly interpreted all of the signs in high percentage but the level of the interpretation of the pedestrian crossing notice was low. This result shows that the awareness level of pedestrians to road signs, shown by the correct interpretation of the road signs, in the study area is very high as represented in Figure 3. On the average, about 73.72% of the respondents had awareness of the various signs present.

S/No	Road sign	Respondents awareness	Frequency	Percentage frequency (%)	Correct interpretation	Frequency	Percentage frequency (%)
1	Pedestrian crossing	Yes	98	71.5	Right	75	54.7
		No	38	27.7	Wrong	35	25.5
		<b>Total</b>	<b>136</b>	<b>99.2</b>	<b>I don't know</b>	<b>27</b>	<b>19.7</b>
2	Traffic light	Yes	125	91.2	Right	120	87.6
		No	12	8.8	Wrong	9	6.6
		<b>Total</b>	<b>137</b>	<b>100.0</b>	<b>I don't know</b>	<b>8</b>	<b>5.8</b>
3	Zebra crossing	Yes	114	83.2	Right	116	84.7
		No	21	15.3	Wrong	9	6.6
		<b>Total</b>	<b>135</b>	<b>98.5</b>	<b>I don't know</b>	<b>12</b>	<b>8.8</b>
4	Pedestrian light	Yes	93	67.9	Right	93	67.9
		No	42	30.7	Wrong	12	8.8
		<b>Total</b>	<b>135</b>	<b>98.5</b>	<b>I don't know</b>	<b>32</b>	<b>23.4</b>
5	T-junction	Yes	69	50.4	Right	101	73.7
		No	67	48.9	Wrong	9	6.6
		<b>Total</b>	<b>136</b>	<b>99.3</b>	<b>I don't know</b>	<b>27</b>	<b>19.7</b>

Source: Field Survey, 2016

Table 2: Awareness of specific road signs and their correctness of interpretations for pedestrians

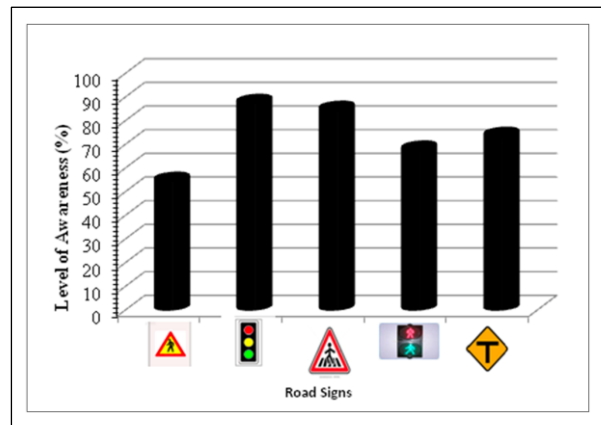


Fig. 3: Pedestrians' Road Signs Knowledge (Correct Interpretation of Road Signs)

#### COMPLIANCE LEVEL OF PEDESTRIANS TO ROAD SIGNS

During the survey, respondents were questioned on their compliance level and the results are as shown Table 3.

The results revealed that majority of the respondents would use the zebra crossing if it is present, but would not comply with the rule of the pedestrian light and also not obey any other road sign if the road seems free. Pedestrians are less likely to comply with road signs based on the research. On the average, only 37.5% of the respondents obey the signs "always" which is rather low.

S/No	Attributes	Responses	Frequency	Percentage frequency (%)
1	Do you use zebra crossing if it is present?	Always	104	75.9
		Rarely	26	19.0
		Never	3	2.2
		It does not matter	3	2.2
		No response	1	0.7
		<b>Total</b>	<b>137</b>	<b>100.0</b>
2	Do you always wait for pedestrian light to turn green before crossing	Always	28	20.4
		Sometimes	59	43.1
		Rarely	28	20.4
		I have not noticed on campus	21	15.3
		No response	1	0.7
		<b>Total</b>	<b>137</b>	<b>99.9</b>
3	Do you obey road signs even when the road seems free of vehicles?	Always	22	16.1
		Sometimes	40	29.2
		Rarely	40	29.2
		No need to obey	33	24.1
		No response	2	1.4
		<b>Total</b>	<b>137</b>	<b>100.0</b>

Source: Field Survey, 2016

Table 3: Compliance level of pedestrians to road signs

Cross-tabulation of pedestrians' knowledge of and obedience to road signs							
		Count	Do you obey signs even when the road seems free?				Total
			Always	Sometimes	Rarely	No need to obey	
Do pedestrians have knowledge of road signs?	Yes	Count	19	39	37	30	125
		Expected Count	20.1	36.5	37.4	31.0	125.0
		% within - Do pedestrians have knowledge of road signs?	15.2%	31.2%	29.6%	24.0%	100.0%
		% within - Do you obey signs even when the road seems free?	86.4%	97.5%	90.2%	88.2%	91.2%
	% of Total	13.9%	28.5%	27.0%	21.9%	91.2%	
	No	Count	1	1	1	2	5
		Expected Count	0.8	1.5	1.5	1.2	5.0
		% within - Do pedestrians have knowledge of road signs?	20.0%	20.0%	20.0%	40.0%	100.0%
		% within Do you obey signs even when the road seems free?	4.5%	2.5%	2.4%	5.9%	3.6%
	% of Total	0.7%	0.7%	0.7%	1.5%	3.6%	
	Indifferent	Count	2	0	3	2	7
		Expected Count	1.1	2.0	2.1	1.7	7.0
% within Do pedestrians have knowledge of road signs?		28.6%	0.0%	42.9%	28.6%	100.0%	
% within Do you obey signs even when the road seems free?		9.1%	0.0%	7.3%	5.9%	5.1%	
% of Total	1.5%	0.0%	2.2%	1.5%	5.1%		
Total	Count	22	40	41	34	137	
	Expected Count	22.0	40.0	41.0	34.0	137.0	
	% within Do pedestrians have knowledge of road signs?	16.1%	29.2%	29.9%	24.8%	100.0%	
	% within Do you obey signs even when the road seems free?	100.0%	100.0%	100.0%	100.0%	100.0%	
	% of Total	16.1%	29.2%	29.9%	24.8%	100.0%	

Source: Field Analysis, 2016

Table 4: Do pedestrians have knowledge of road signs? \* Do you obey signs even when the road seems free?

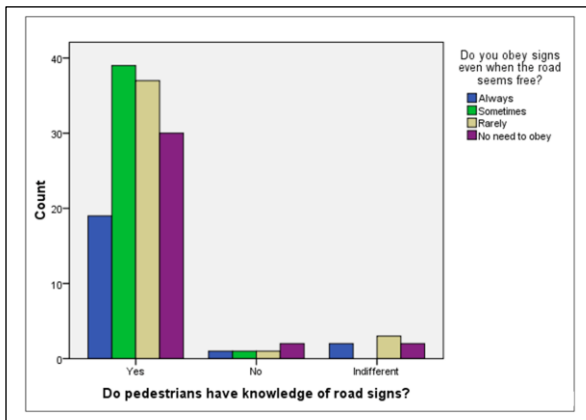


Fig. 4: Pedestrians knowledge of Road signs cross-tabulated with obeying the signs

On a cross tabulation of awareness to compliance of the road users, majority of the pedestrians that have knowledge of the road signs obey sometimes while those that lack the knowledge of road signs see no need to obey the road signs and those that feel indifferent to the knowledge of road signs rarely obey the signs when the road seems free as shown in figure 4.

Chi-Square Analysis

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.247 <sup>a</sup>	6	0.643
Likelihood Ratio	6.073	6	0.415
Linear-by-Linear Association	.117	1	0.733
N of Valid Cases	137		

a. 8 cells (66.7%) have expected count less than 5.

As shown from a chi-square analysis, there is a strong correlation (64%) between awareness and compliance to road signs in the study area.

### PEDESTRIAN COMPLIANCE OBSERVATION

A survey was carried out using a camera to observe the compliance level of respondents in their natural environment without their notice. This was done in order to compare the level of compliance based on results gotten from the questionnaire and that of reality. As most times biases come into play when people fill questionnaire, there is the urge for most respondents not to be wrong in their choice of answers and as such sincere answers are not given hence the need for the reality check.

Two areas were selected for the observation: Moremi-Fajuyi Axis and Senate-Health Sciences Axis. The reasons why these spots were chosen are because there are road signs there: the zebra crossings and the traffic light which happen to be the most commonly found signs on campus. Another reason for the choice is that the road use of these areas is high.

The video observation shows that of the 45 people observed at the Fajuyi-Moremi axis zebra crossing, only 35.5% used the zebra crossing (see table 5). At the Senate building-health sciences zebra crossing axis, 74.4% complied with the use of zebra crossing. The percentage compliance with facing traffic at the Moremi-Fajuyi axis was very high (88.8%) but was little below average (53.5%) at the senate building-health sciences axis. This shows that pedestrians at the Senate-Health sciences axis prefer not to face traffic.

S/No	Roads	Variable	Frequency	Total observed	% compliance
1	Fajuyi-Moremi	Pedestrians making use zebra crossing	16	45	35.5
		Pedestrians facing traffic	40	45	88.8
2	Senate - Health sciences	Pedestrians making use of zebra crossing	32	43	74.4
		Pedestrians facing traffic	23	43	53.5

Source: Field survey, 2016

Table 5: Pedestrian compliance observation

The results obtained as shown in the tables above shows that the compliance level in reality is rather low as compared to their responses in the questionnaire.

### DISCUSSION

Accident rates in Nigeria are on the increase year in year out. A lot of reasons have been stated to be the cause. But the understanding of roads by road users has rarely been searched out. The aim of this research was to study the awareness of road signs by road users and their compliance with it. The research was carried out within the Obafemi Awolowo University community.

Questionnaire and field observation were done and being an academic environment, the research found out that there is a high awareness level for roads signs but unfortunately the corresponding compliance rate was really low. A major reason noted for the compliance rate is that there are sanctions placed by the school security team in terms of fine for people who violate the rules. If these sanctions did not exist, the compliance would have been poorer or none existence. The state of the road signs in the campus is really poor and the capacity at which the school security is currently operating is not to standard.

Accidents have occurred in the study area as a result of violations of the most basic and simple road signs though these accidents are not fatal as only on rare cases have lives been lost.

## CONCLUSION

Accidents rate will be well reduced when road users become more roads friendly and one way this can be achieved is when knowledge becomes practice. Although the knowledge and use of road signs are not the only way in which road crashes are reduced, however, these in combination with drivers' attitudes on the road as well as the condition of the roads itself and other factors like conditions of vehicle all work hand in hand to reduce accidents' rates. The road signs should however be in proper condition where the road users can easily sight them.

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